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THE PROPOSED GRAND NEW YORK HOTEL.

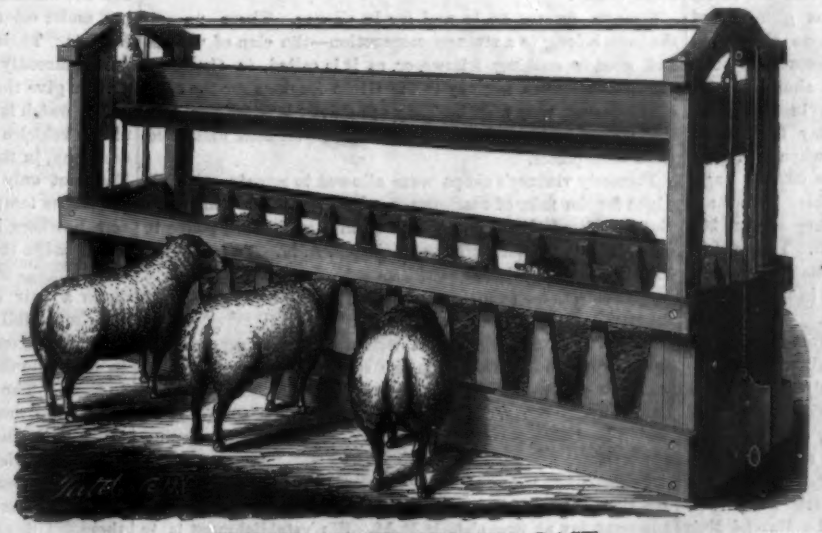
We transfer to our columns an engraving from the London *Engineering*, which represents Mr. Hiram Cranston's proposed new hotel, which was to have been erected on the Fifth Avenue, opposite the main entrance of the Central Park, covering the block of ground between 59th and 60th streets. The lots of ground, which were to have been the site of the structure, have just been sold at auction, and this has somewhat revived the interest felt in the undertaking. These lots were thirty-four in number. At the sale, eight lots on Fifth Avenue brought an average of $21,012 each; eight lots on Madison Avenue $8,420 each; nine lots on 59th street $8,611 each, and nine lots on 60th street $8,588 each. The aggregate amount of the sales was $395,000; cost of the ground eighteen months since, $350,000. The architecture of the hotel, as seen in the engraving, is noteworthy as being similar to that of public buildings, palaces, etc., in France and some other parts of Europe, but has not hitherto been adopted in this country.

PROPOSED NEW YORK HOTEL OF MR. HIRAM CRANSTON, AT CENTRAL PARK.

Improved Sheep Feeding Rack.

It is well known that sheep waste about as much as they eat when they pull the hay through an ordinary rack, and to save this waste and keep their feeding places clean is the object of the invention exhibited in the accompanying engraving.

The slats are about four inches wide at the top and two at the bottom, and the hay is spread on the bottom of the frame, which may be either a partition or a wall rack. By partitioning the rack, roots may be fed to the animals on one side and hay to those on the other. The sheep cannot trample their food, and will not pull it through to waste it. There is a sliding trough for grain, seen in the engraving elevated, having a partition running lengthwise, which can be elevated while hay is being fed, or lowered when grain is given. While elevated, it is easy to arrange the grain or roots, and the trough is readily lowered by means of the cords and counterweights at the ends. In the use of this device the sheep cannot crowd nor waste.



SEXTON'S SHEEP-FEEDING RACK.

It was patented through the Scientific American Patent Agency, June 5, 1866, by D. F. Sexton, of Whiting, Vt., whom address for further particulars. Parties will also receive attention by addressing J. H. Thomas, Orwell, Vt.

Vessel Caught in the Ice at the Polar Sea.

Dr. Hayes, in his narrative of the open Polar Sea, thus refers to a moment when his vessel was caught in the ice, and its destruction made momentarily imminent:—

The scene around us was as imposing as it was alarming. Except the earthquake and volcano, there is not in nature an exhibition of force comparable with that of the ice fields of the Arctic Seas. They close together, when driven by the wind or by currents against the land or other resisting object, with the pressure of millions of moving tuns, and the crash and noise and confusion are truly terrific. We are now in the midst of one of the most thrilling of these exhibitions of Polar dynamics, and we became uncomfortably conscious that the schooner was to become a sort of dynamometer. Vast ridges were thrown up wherever the floes came together, to be submerged again when the pressure was exerted in another quarter; and over the sea around us these pulsating lines of uplift, which in some cases reached an altitude of not less than sixty feet—higher than our mast head—told of the strength and power of the enemy which was threatening us. We had worked ourselves into a triangular space formed by the contact of three fields. At first there was plenty of room to turn round, though no chance to escape. We were nicely docked, and vainly hoped that we were safe; but the corners of the protecting floes were crushed off, the space narrowed little by little, and we listened to the crackling and crunching of the ice, and watched its progress with consternation. At length the ice touched the schooner, and it appeared as if her destiny was sealed. She groaned like a conscious thing in pain, and writhed and twisted as if to escape her adversary, trembling in every timber from truck to kelson. Her sides seemed to be giving way. Her deck timbers were bowed up, and the seams of the deck planks were opened. I gave up for lost the little craft which had gallantly carried us through so many scenes of peril; but her sides were solid and her ribs strong; and the ice on the port side, working gradually under the bilge, at length, with a jerk which sent us all reeling, lifted her out of the water; and the floes, still pressing on and breaking, as they were crowded together, a vast ridge was piling up beneath and around us; and, as if with the elevating power of a thousand jack screws, we found ourselves going slowly up in the air.

New and Simple Dry Process.

At a late meeting of the London Photographic Society, Mr. William England described a dry process which he has found to fulfill better than any other the conditions required in a dry-plate process of photography. We may here premise that the pictures which were exhibited as having been obtained by means of the process in question were excellent, and in no way inferior to any that could have been produced by means of wet collodion from the same subjects. The plates are exceedingly sensitive, judging from the ordinary dry-plate standard; the certainty seems such as to satisfy even exigeant experimenters, while the keeping properties may be deduced from the fact of one of the pictures exhibited having been printed from a negative kept seven weeks previous to development.

A plate is coated with ordinary collodion and excited in a forty-grain bath. It is then washed until all "greasiness" disappears, by being transferred first to a bath of distilled water, followed by a similar application of common water. Some plain albumen, to which a few drops of ammonia have been added, is now poured over the surface and made to travel over every part of the film, for which purpose it should be several times tilted backward and forward. The film is now washed, so as apparently to remove the albumen, some of which, however, will always remain, no matter how prolonged may be the washing to which it is subjected. The plate now receives a final sensitizing, by having poured over its surface a thirty grain solution of nitrate of silver to which a few drops of acetic acid have been added. The plate is now subjected to a final and thorough washing, and is then dried. The exposure required is about three times that given to a wet collodion plate. A plain solution of pyrogallic acid, of the strength of two or three grains to the ounce, serves to develop all the details which are afterward strengthened in the usual manner (by citric acid and silver).

Mr. England prefers to fix with weak cyanide of potassium, although hyposulphite of soda may be employed for the same purpose.—*British Journal of Photography.*

THE GREAT MARKETS OF PARIS.

Translated for Every Saturday from the French.

There is in the heart of Paris a monument where 1,900,000 mouths seek daily food; in whose neighborhood are to be found street after street which wake when the other portions of the city prepare for sleep; a quarter traversed every night by 12,000 vehicles, and which from 4 to 10 o'clock, A. M., sees added to its 42,000 inhabitants a floating population of at least 60,000 souls; in one word, the Great Markets.

Six uniform divisions, marshalled in two ranks, are sheltered under an immense iron roof, which has a superficies of 20,000 yards. A forest of delicate and elegant small columns support this gigantic roof. Broad sidewalks planted with trees, extend around the vast parallelogram, which is crossed by three broad covered avenues. The six divisions have each their especial trade. One is devoted to fruit and flowers; another to vegetables; another to fish; this to eggs and butter by the wholesale; that to game and poultry; as for the sixth and last, so many different sorts of things are sold there that the Archbishop of Phris himself could not hear to the end the long enumeration of them.

It was when the new Great Markets were opened. Archbishop Sibour had at his elbow a cicerone, whose duty it was to inform him of the destination of the several divisions, as he blessed them one after the other. He had already blessed five of them. When he reached the sixth the cicerone said, "This is the division of retail butter." "I bless the division of retail butter," said the Archbishop, raising his hands. "And of bread," whispered the cicerone. "Of retail butter and bread," added the Archbishop, catching himself. "And of cooked meat." "Of retail butter and bread and cooked meat." "And kitchen furniture." "Oh!" exclaimed the good Archbishop, making a gesture of despair, "I bless everything."

Beneath the Great Markets visible are the cellars. There are thirty of them. As a general rule, each cellar is a basement floor which is an exact copy of the division above ground. There are the same lines of stalls, only instead of the stalls above ground there are lofty recesses, divided by iron railing, with numbers corresponding to the numbers of the shops above them. These recesses are the stock rooms of the market people; they keep their stock and baskets in them. They are all alike; except that the fishmongers have, besides, reservoirs supplied with running water, where fishes are kept alive.

In the cellar of retail butter dealers several conscientious tradesmen are to be discovered giving their stock (which is sometimes a little rancid) the desired fresh taste. They mix by gas light on wooden boards their venerable butter, water it, add a little flour if the butter lacks consistency, and if it is too pale they add carrot juice or carmine, which in a few moments gives the palest butter the beautiful orange color so dear to all housewives.

In the next cellar are the poultry shambles. Around eight immense marble tables, placed equidistant from each other and in regular order, are men, women, and children, cutting, clipping, tearing, picking, pulling. They have all been at work since 11 o'clock, P. M., and they will not have ended their task before 5 or 6 o'clock, A. M.: for they have to prepare some 1,000 or 1,200 geese, turkeys, chickens, ducks, or pigeons for the market stalls. Everywhere in the neighborhood of this cellar one sees nothing but baskets full of feathers, baskets full of poultry under sentence of death, heaps of dressed poultry. Here is a line of ducks hanging by one leg, head downward. Presently a young girl comes with a huge knife. Her little hand slips the steel on the neck of the duck nearest her. You would think she was caressing it, she is so rapid and so light. She goes to the next, and to the next, and to the next; a second for each duck. She passes on, her task ended, as quietly as if she had been pricking apples for the oven.

The Great Markets are still quiet, but labor has begun its tasks even above ground. One detects faint glimmers of light through the iron railings of the divisions allotted to fruit and vegetables. If one goes near, one discovers women seated around lamps or lanterns. They are shelling peas. A large number of women earn their daily bread for six months of the year by shelling peas. One may form some conception of the number of peas required, when he is told that Paris consumes during these six months 600,000 bags, say 30,000,000 quarts, of the valuable vegetable. There are some vegetable preservers who employ every season 200 women to do nothing but shell peas for them. They get 30 sous for shelling a large basket which contains 25 pounds of peas. An active woman can shell 50 pounds in her 10 or 12 hours of labor; but then she must not dawdle.

The porters of the Great Markets are organized in an excellent association. Five or six hundred members belong to their society, and they unload and load not only in the Great Markets, but in several important markets. They are divided into gangs, which are subdivided into squads, each having a "boss" or head man. At the Great Markets are to be found the butter porters, the fruit porters, the meat porters, the flour porters, and the others. Markets in Paris have their porters: La Vallée porters, Le Mail porters, Le Marché Noir porters. A head "boss" is invested with the sovereignty over all of them, although he does not receive one sou more than any of them. He is the beau-ideal of the constitutional monarch. He is paid little or nothing, and personally has no power, neither to reward nor to punish. The butter porters and meat porters earn their 10 francs a morning. Next to them come the fruit porters, and the fish and flour porters. The latter earn at most 5 francs a morning; to make up this disproportion, the police allow the flour porters to work for bakers, and the fish porters to unload peas. The people we see arranging long narrow bags in lines, like so many sausages, along the sidewalks, are porters of the Great Markets. While a squad work under the eye of their "boss," another squad, stretched at length on the sidewalk, take their rest. They sleep under the feet of passers, their heads covered with their striped cotton caps. Near them lies the white felt hat, with an immense brim, their classical headpiece, which is, however, merely an accessory of their costume, and is not, as is commonly believed, the essential element of it. The porter never wears this hat unless he has sacks to carry, for when he has baskets to carry he places them on a leathern cushion secured to his shoulder, and when he has back baskets to carry he places around his neck a wadded collar, to prevent the friction of the basket. When you see in the Great Markets a tall, stalwart fellow, with merely a moustache, with square shoulders and solid legs, calm, silent, and active, as a general rule you may be sure he is a porter. And when you see a little fellow, fat, well fed, clean shaved, looking like a retired tradesman who is sauntering for pleasure, but bends every moment under the weight of his abdomen and is constantly obliged to take a seat in order to support his own weight, be sure he is a "boss."

As we quit the porters we discover in obscurity the Awakener. He undertakes, for a trifling amount of money, to rouse at any given hour of the night whoever may confide the care of their interests to him. It is a grave question for the laborers of the Great Markets to be roused in due season. He goes about the streets in the neighborhood of the Great Markets from 10 o'clock, P. M., to 4 o'clock, A. M., bawling to this one, ringing up that one, and continuing to bawl and ring until the sleeper gives signs of life by bawling back or tapping on the window. Each customer pays him one or two sous a night, or between thirty sous and three francs a month, according to the distance he is obliged to come. Some customers give him as much as three sous; these are the hard sleepers, who must be pulled out of bed or be shaken by the arm. The Awakener is an enameller by trade, and he can make good days' wages; but he prefers poor nights ill-paid passed out of doors. His trade of Awakener used to bring him in on an average $480 a year.

Near by, on stools, are several men; no shirts; their whole costume consisting of canvas pantaloons, secured by a strap around their waist. They throw vague objects into immense boilers. These strange workmen are artichoke boilers. An active, lively, healthy brunette, the mistress of the establishment, stimulates them by voice and gesture. Her name is Pauline Gandon. She is the largest artichoke boiler of the neighborhood. During four months of the year she does business to the amount of $4,000. In the artichoke season, wagons full of them are daily emptied in front of her door. Women wash them and cut off the stalk. They are then sorted, according to size, and packed in the boilers, the several layers being separated by linen cloths. An immense wood fire is carefully kept up, during the whole period of time required to cook them, and which lasts till daybreak. From 5 o'clock, A. M., to 8 o'clock, A. M., there is quite a procession of green grocers, petty eating-house keepers, and vegetable pedlars coming to purchase their daily supply. In these three hours' time at least 3,000 artichokes are sold. There are not above three or four great artichoke boilers in the neighborhood of the Great Markets, because this business requires not only the appliances to carry it on, but a good many servants and large daily expenditure of ready money.

Let us return to the Great Markets. Already the market gardeners are beginning to spread their stock in trade. They come early to select their place—to secure a favorite corner; and then most of them bring articles which can be sold as soon as the bell announces two o'clock. Here are potatoes, there are salads, yonder are fruits or cresses taken out of the carts and placed on the market. After the marketmen and marketwomen count their baskets, they lie down in the midst of their vegetables. Some of them keep watch, wrapped in their thick cloaks.

Strange figures go to and fro in silence. These uneasy shadows belong to a strange corporation—the clan of vicious and good-for-nothing fellows, or, as it is called, *la Gouape*—vagabonds driven nightly to the Great Markets for the sake of the shelter they afford. They are chiefly lazy fellows, professional thieves, and good-for-nothing workmen dismissed from their places.

Formerly vintner's shops were allowed to remain open all night for the sake of marketmen who come from a distance. But the disorderly scenes witnessed in them led the police to interdict their opening before 3 o'clock, A. M. To lessen the inconveniences of this measure, some men were authorized to hawk coffee among the market gardeners and other nocturnal laborers.

Observe those young fellows with aprons, moving actively from group to group. Each one carries a tin apparatus to which a great many tin boxes, that jingle as he moves, are suspended by hooks. A box contains spoons, and small papers which hold each two lumps of sugar. These are Saussercusses waiters.

Saussercusse is one of the characters of the Great Markets. He rises regularly at eleven o'clock, P. M., and goes to bed the next day at four o'clock, P. M. His establishment is in the Rue des Innocents, and is the rendezvous of all the market-gardeners. They go there to await the opening of their respective markets; they sleep or take a bowl of coffee in this house, which is an old establishment. It is higher than it is wide. It consists of a celler, ground floor above, and first story, placed one on the other. A circular stair case goes to the first story, while a stone ladder goes to the cellar. Each story has its individuality. The first is a dormitory till daybreak. Market men and market women lay pell mell on the floor—these lying lengthways, those sideways, others anyway between the legs of chairs and tables. The fifteen or twenty leagues they have travelled to bring us vegetables are their excuse. Some of them spend all their time on the road, and often pass two months without sleeping in a bed. On the ground floor the customers sleep, seated or standing, but they have not courage enough to acknowledge that they are sleeping. They would persuade themselves that they are eating or drinking. Leaning against the wall, or the shoulder of a good-natured brother market-man, their hand on their cup of coffee, or chocolate, they look as if they would defy sleep; but invaded by the warm vapor which arises form the immense kitchen range built in one of the angles of the room, the movement of the waiters or the momentary elevation of voices, they are unable to keep sleep at a distance.

At Saussercusse's the meal consists of ten sous of meat, five sous of wine, and two sous of bread. There is not much sleeping in the cellar; nevertheless, sonorous snores are occasionally heard mingling with the clatter of plates and forks. The principle section is half filled by two immense copper boilers. It is in these boilers that Saussercusse makes his coffee, and chocolate. He sells about one thousand cups a day at four or six sous each. At least five hundred cups are sold out of doors by those active waiters with tin vessels above mentioned. They go their beats around the market several times during the night and until seven o'clock A. M. After ten o'clock the establishment is entirely empty; and if it still remains open half the day, it is partly to give customers time to pay their nights expenses. The majority of them rarely pay cash. They pay after market hours.

Day is breaking. It is time to quit Saussercusse's, if we would witness the Great Arrival. Up to this hour the market men were few and silent as they drove up and discharged their vegetables. They become every moment more numerous. The noise increases; the carts multiply; and all the neighboring street are crowded with them. The quarter is now surrounded by policemen, who allow no vehicle other than market-carts to enter the environs of the market. There are twelve thousand market carts in Paris and the neighborhood which regularly bring vegetables to the city; about six thousand come every day. The apparently inevitable disorder formerly produced by such a throng of market vehicles—to say nothing of purchasers—has been abated by the present organization of the Great Arrival, which was introduced only two or three years ago. At present, every market-man has his particular entrance, his place of unloading, and his particular exit. The road followed by the market-men is regulated beforehand; their vehicles move with perfect order, which is a little surprising when one considers the few policemen on duty. The ingenious organization of the present arrangement is due to the Inspector General, who may every day be seen, between three and five o'clock, A. M., directing the manœuvres like some military commander. "Halt, water-cresses!" "To the left, cauliflowers!" "Go ahead, turnips!" "This way, ye gardeners!" "Put out that hack!" The rustic vehicles move in good order before his eyes. Each market-man as he enters makes a declaration at the clerk's office of the number of bags or panniers he brings, and of the superficies of square yards he wishes to occupy. The cost of the stands is three cents a yard on the outside sidewalks, and six cents a yard on the covered sidewalks. The clerk gives him a ticket, which is his title to possession. He then goes to the portion of the market where the sale of the sort of provisions he brings takes place. There the porters unload his vehicle, and see if the number of bags or baskets is the same as the number stated on his ticket. Then the vehicle is taken to one of the empty vehicle stands. There are no less than fifty-seven empty vehicle stands in the neighborhood of the Great Markets. Formerly the municipal authorities levied the toll for occupying these stands; at present they are leased to a company, which pays $46,600 for the toll. As market men, busily engaged in arranging their stock, would find it inconvenient to drive their vehicles to the proper stand, men have undertaken the business for them. These drivers are twenty in number, under command of a "boss," to whom they pay over their receipts. Their wages are forty cents a day, and the marketmen commonly give them one cent for each vehicle. These drivers give the empty vehicles to the watchmen.

The watch is composed of men and women, who take care of the vehicles confided to them. They form quite a numerous army, in the pay of the company which farms the stands. They not only take care of the vehicles, but of the heaps of provisions temporarily left on the sidewalks by the greengrocers, hawkers, and the like. They are distinguished by the metal badge they wear on the left arm and the steel chain which hangs from their waist. There is at the end of this chain a pair of pincers, closed by a key, and which retains the counterfoil of the little green, white, yellow, or red tickets they deliver for receipts. The color of these tickets serves to designate the sort of heap or the kind of vehicle confided to them. The majority of these watchmen are women. They are for the most part good creatures, and are on excellent terms with their customers, who refuse to call them by their numbers, which they have borne since their new organization. They give them their old nicknames which were in vogue before they were organized by the company which has enlisted them. This one is called "Green Peas," that one "Planks Marie."

At four o'clock, A. M., the market bell rings to announce the opening of the market. None but vegetable dealers have the right to begin to sell as soon as they begin to unload. All the others are forbidden to enter into negotiations with purchasers before this bell rings. Sellers are looking sharp, purchasers are examining the provisions; some men, who seem to be loitering idly, are watching a basket as a cat watches

a mouse. When the bell rings the scene changes into one of the greatest confusion, apparently. Buyers clamor for baskets, and before the bell ceases ringing thousands of baskets have changed hands.

The retail market-women rent the stalls in the Market. Their hours of sale are all the day long. They are the chief go-between of market gardener and buyer. They pay the rent for their stalls (each has her name painted above her stall) by the week, and in advance. The price varies, according to position, from 70 cents to $2.10. There are two other sorts of huckstering. One is carried on by people who buy from the market gardeners vegetables, etc., at the period of the day when they are extremely cheap (for instance, at the close of the market), to sell them when they have risen in value. The other is driven by market-gareeners themselves, who come with empty baskets and buy in the morning from their brethren wherewithal to fill them.

Here a portion of the itinerant greengrocers called hawkers, buy the damaged fruit they hawk at low prices in the quarter of Paris peopled by the laboring classes. There are some 12,000 hawkers daily moving about Paris, who come every morning to the Great Markets for their supplies. They are watched by special inspectors, whose duty it is to see that they do not stop in the streets or loiter in the neighborhood of markets.

BUSINESS AND MANUFACTURING ITEMS.

GLASS IN ILLINOIS.—A correspondent corrects the statement that the manufacture of glass in La Salle was first commenced in 1865. Glass making was first started in La Salle in 1857 by J. P. Colné, who formed a company with $10,000 capital in less than a week, and the factory was just getting into operation, a melting having been already made, when the financial crash of 1857 extinguished the enterprise. Mr. Colné was the first who brought to public attention the utility of this sand, which abounds in many parts of Illinois. The factory was subsequently bought by parties who are now running it.——A glass factory was built at Bellaire, Ohio, last year, and now a rolling-mill and a nail factory are in process of construction.——A glass factory is talked of at Jackson, Mich.

LUMBER.—The lumber manufacture and traffic is the leading business of Fond du Lac, Wis. There are fourteen steam saw-mills and as many steam shingle mills in operation, running each from two or three to seven or eight saws of various kinds, with twenty to fifty men, besides boys and girls for packing lath and shingles, and turning out a grand total, as estimated, of 85 million of lumber, 225 million of shingles, and 18 million of laths, in a season. The lumber is cut and rafted on the affluents of the Fox and Wolf Rivers, in the north-eastern part of the state, where immense pine forests are intersected in all directions by these natural highways. There are five different kinds of shingle mills in use, three of which were invented on the spot. The hands earn about $10 a week on common mill and pinery work—alternating between the two, winter and summer—and engineers, head sawyers and filers get $2.50 a day. A filer in Moore's mill, who works on the eight hour system—eight hours before dinner and eight hours after—earns $5 a day.——The lumber business of Albany, N. Y., engages some twenty-five considerable firms, one of the largest of which handles thirty millions a year. Ten millions of Michigan lumber are sold there yearly by the agent of the Whitneys of Detroit. Large quantities also come from Canada.——There is a portable steam saw-mill at South Carver, Mass., which like Mahomet can go to the mountain if the mountain won't come to be sawed.——A floating steam planing mill is building at Bangor, Me., through which rough cargoes will pass, coming down the stream, and go on their way rejoicing in smoothed and jointed surfaces.

LEATHER.—Leather, boots and shoes, instead of cotton and woolen, according to the Boston *Commercial Bulletin*, are the leading manufacture of New England. The cotton and woolen manufacture is concentrated at a few points; the leather manufacture is dispersed; and although the number of hands employed in the leather business is smaller than in that of cloth manufacture, the amount paid to its operatives in annual wages is considerably larger. The sales of shoes in Lynn amounted in February to $1,011,513; in March to $1,255,454—the largest month's sale ever made in the city. In the manufacture of patent leather, F. S. Merrill, of Roxbury, the largest manufacturer in New England, employs about sixty hands, and has facilities for turning out about 50,000 sides per year, but during the present "dull times" the business has decreased at least one half.—The manufacture of the new leather-splitting machine, by which several hides can be made of one, will soon begin at Newburyport.——The peg factory at Livermore Center, Me., consumes about one cord of white birch per day, and turns out 1,000 quarts of pegs.

WOOLEN.—Burrillville, R. I., comprises ten manufacturing villages, containing twenty woolen mills, with an aggregate of over 100 sets of machinery.——The Tremont and Suffolk Mills, of Lowell, have decided upon a stoppage of half their machinery and the entire cessation of woolen manufacture. Other corporations of Lowell are contemplating similar action. ——A flannel mill is to be built on the site of the old "Endicott Mills," near Newport, R. I., four stories high and containing five sets of machinery. It will be finished about Oct. 1st. ——A woolen mill is to be built at Oneida, N. Y.——A company has recently built a fine woolen mill at Clinton, Lenawee Co., Mich. It will have six sets of machinery and will go into operation about August 1st, employing eighty hands.——An effort is being made to raise $30,000 capital for a woolen mill at St. Clair, Mich., to take the place of Nichols' mill, burned last year.——Parties propose to build at Niles, Mich., within a short time, a woolen mill, a paper mill, and an oil mill.——Stock has been subscribed in part for a new woolen mill at Jackson, Mich., which will cost $50,000 to $75,000.——A foundery and a woolen mill are to be started at Bethany, Harrison Co., Mo., this season.——There are now in operation in the States of Illinois, Wisconsin, Indiana, Iowa, Michigan, Minnesota, and Ohio, about 175 woolen mills, more than half of which have been started since 1860, running 350 sets of machinery, and consuming annually about 8,500,000 lbs. of clean wool.——At San Antonio, Texas, a cotton and woolen mill is being organized.

COTTON.—Most of the mills owned by the A. & W. Sprague Manufacturing Company are in full blast. Besides the Augusta purchase and their extensive works in Central Falls and elsewhere, they carry on the Baltic, 75,136 spindles and 1,973 looms; Quidnick (two mills), 26,880 spindles and 654 looms; Arctic, 22,144 spindles and 560 looms; and Natick (four mills), 40,608 spindles and 975 looms—total, 164,768 spindles and 4,162 looms.——The Kalmia Cotton Mills, in South Carolina, have been sold to a new company for $210,000, subject to a mortgage of $190,000.——It is supposed that work will soon be resumed on the Taft Cotton Mill, at Taftville, Ct., the owners of which recently failed, and which, if finished, will be the largest cotton mill, it is said, in the world.——A. D. Smith, Woonsocket, R. I., is enlarging his cotton mill by two additions, making the whole building three stories high, with a complement of 10,000 spindles.——A cotton mill is talked of at Millport, Chemung Co., N. Y.

IRON.—It is said that Mr. Bessemer now enjoys from his patents for the conversion of iron into steel, the princely income of $500,000 a year.——Messrs. Fairbanks, of St Johnsbury, Vt., the original inventors of the platform scales, although no longer protected by patents, melt up in their manufacture over thirteen tuns of iron per day, and shipped from their works, during ten days in April, 2,923 boxes of scales, weighing over 222 tuns. They are about occupying a new foundery which is one of the completest in the country.——Notwithstanding the prohibitory law, now so energetically pushed in Massachusetts, about 150 hands are employed at East Bridgewater in the manufacture of gins, which were exported to the cotton states, Brazil, etc., to the amount of $500,000, last year.——A very heavy compressing machine is building at Poughkeepsie for the Hudson River Peat Company. The metal used in it weighs 200 tuns, several of the castings weighing one to seven tuns each. It will be driven by an engine of 100 horse-power.——A company has been organized at Albany for the manufacture of Youmans' patent car truck, in which the axles adjust themselves at all times at right angles to the track and radially to the curves.——A new file manufactory is building at Norwich Conn.——Russia sheet-iron works are to be established at Portsmouth, Ohio, which seems in some measure to confirm the reported success of the operation at Youngstown.——The Wrightsville Iron Company, of Columbia, Pa., capital $80,000, have commenced building their furnace and expect to get to work in October next.——New rolling mills are to be established at Marietta, Ohio, and at Indianapolis, and two furnaces are to be erected at Brazil, Clay Co., Ind.——At Marquette, Mich., five furnaces, a rolling mill, foundery and machine shop, and several other manufactories will soon be in operation. Work has commenced on the new furnace and mill of the Marquette and Pacific Rolling Mill Company, which will employ several hundred hands.——The Ellis Locomotive Works, at Schenectady, N. Y., are now employing 480 men and turning out a finished locomotive every week, having a contract for twelve from the Union Pacific Railroad Company.——It is computed that the whole number of sewing machines is now 750,000, and that the present rate of increase is 200,000 a year.——The U. S. Railroad Screw Spike Company, at Greenpoint, N. Y., perform something like the novel operation of forging screws, which has been introduced in France. The thread is formed between top and bottom swedges, equivalent to a threaded nut cut in halves, under an atmospheric hammer, the bolt being turned between the blows, until the swedges come together.——A company in Bridgeport is manufacturing the submerged force pump, which is fastened in the bottom of the well or cistern, and projects a rigid iron pipe to the surface, which being oscillated by hand at once operates the mechanism and conducts the stream. No packing is used, and no water can stand in the pipe above the surface of the water, to freeze in cold weather.

THE STEAMSHIPS OF THE GREAT LAKES.—The Western Transportation Company will run this season twelve screw steamers of an aggregate tunnage of nearly 10,000 tuns between Buffalo, Chicago, Milwaukee and Racine. The Buffalo, Cleveland and Chicago line will run eleven steamers, of about 8,400 tuns, between Buffalo, Sheboygan, Milwaukee, Racine and Cleveland. The Buffalo, Cleveland, Toledo and Sandusky line will run thirteen steamers of about 9,800 tuns, between Buffalo, Cleveland, Toledo, Sandusky, Detroit and Green Bay. Evans' line will run six steamers, of about 4,000 tuns, between Buffalo, Chicago, Milwaukee, Racine and Detroit. Charles W. Ensign will run two new vessels, of 1,200 tuns each, between Chicago and Buffalo.

MAINE WATER POWER.—The Kennebec at Augusta has a fall of 15 feet; the Androscoggin at Brunswick has a fall of 50 feet; at Lewiston 64 feet; Emerson's Stream at West Waterville has a fall of 200 feet within five miles. The fall of the water of the Cobbosecontee, at Gardiner, within one mile of the tide-water, is 128 feet; the fall of water in the Vaughan Brook, in Hallowell, within three fourths of a mile of tide-water, is 188 feet.——The citizens of Waterville are endeavoring to raise $75,000 or $100,000 for the improvement of the water power at that place, and the inauguration of extensive manufacturing improvements.

CHEESE.—The cheese factories at Otto, Cattaraugus Co., N. Y., are said to be doing an immense business, and others are starting up in the vicinity—among them one at Ellicottville. ——A cheese factory 40 by 70 and three stories high is in process of construction at West Brookfield, Mass.

OILS AND CHEMICALS.—The buildings of the Manufacturing Company at Coldwater, Mich., have been completed, and the manufacture of linseed oil and corn and oat meal will soon begin. The enterprise, the second of the kind started in the state, will encourage the cultivation of flax, and it is believed that the neighboring region will send to this mill, during the next season, at least 25,000 bushels of flaxseed.——The Pacific Oil Works, at San Francisco, Cal., are now in full operation. The present machinery can consume about 4,000 bushels of flaxseed per week.——The Golden City Chemical Works, recently erected in San Francisco, cost $250,000, and can turn out 20,000 lbs. of sulphuric and 3,000 of nitric acid per day. ——At Sharpsburg, near Pittsburgh, Pa., three oil refineries are being built, one covering an area of seven acres and a river frontage of 700 feet. Two others will each have a capacity for refining 1,200 barrels of oil per week.——The American oil product during the past six years is estimated at about 11,640,670 barrels, for which there have been sunk 7,930 wells, not more than one tenth of which are now believed to be producing oil. In 1859 the product was 325 barrels.

MISCELLANEOUS.—Shoe strings are little things, but very numerous, and in union find strength, at South Carver, Mass., where seventy hands are employed in one shop, making shoe strings and lacings of cotton, silk and linen, to the value of $175,000 annually.——The soapstone stoves appear to find increasing favor, as new buildings are now being erected by the manufacturers at Nashua, N. H., who have a capital of $150,000 invested in the business, and a single order on hand for 7,000 stoves.——Jelly from unfermented apple juice was made at Livermore Falls, Me., to the amount of 16,000 lbs., last season.——A Meriden, Conn., Hat Company has been formed, to make hats by a machine which weaves them whole—capital $400,000.——Boston and East Boston are to be connected by a suspension bridge that will cost half a million.——A bridge is to be built across the Ohio river at Louisville, Ky., 360 feet long and to cost $1,500,000.

PRELLER'S PATENT TANNING PROCESS.

In sole leather tanned by Preller's patent the fibrous structure is entirely preserved, and in a condensed state, of great strength and solidity: comparing with oak-tanned leather by weight as 34 to 50, from 100 pounds of green hide, and showing much less thickness than the distended and weighted leather produced by ordinary processes. On tearing, the latter discloses a felty structure, whereas the former shows all its fibers in their original parallel juxtaposition, and by experiment, resists at one fourth of an inch thickness, in constant working, more strain than the best oak-tanned three eighths of an inch thick. The obvious practical advantages of the lessened bulk and greater flexibility need not be suggested. Butts, it may be remarked, become available, from improved flexibility, for purposes to which they were hitherto unsuited, and by paring them a very large even horsehide may be obtained for many useful purposes, especially carriage tops. Another comparative test which is very suggestive, is that of boiling. Ordinary leather attains in this way a woolly texture and becomes brittle, or else becomes converted into a kind of gelatinous mass. Preller's leather, on the contrary, seems to "boil down" to a tougher, denser, and still fibrous condition, resembling horn. Calf leather, it is evident, will realize similar advantages, of which the last that we shall mention is that it can be tanned in sixteen hours; sole leather requiring but 2½ days. Having these effects in view the tendencies of the process may be the better appreciated. It is as follows:

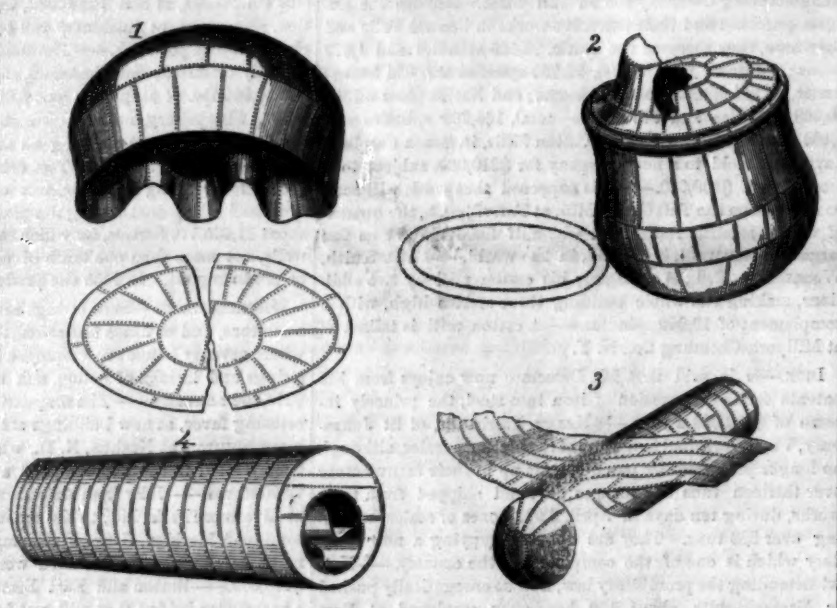
The hides are slightly washed, and then unhaired in the usual manner. Next they undergo a partial drying, and receive a uniform coating of a peculiar paste, which is the main feature of the invention, and is a compound of various vegetable, animal, and saline substances. The vegetable substances are such as contain a large proportion of starch and little gluten—such as barley flour, rice flour or starch itself. The animal substances are of a fatty nature; ox brains, butter, milk, animal oil, or grease. Salt and saltpeter are used merely as preservatives for the brains and the butter. Next the hides are put into the interior of large drums, around the inner peripheries of which a number of stout pegs are disposed radially, the intention of which is to beat up and mellow the hides and to effect an equal distribution of the moisture they still retain, and the complete and uniform absorption of the paste throughout their fibrous system. The drums are driven by a steam engine and to promote a drying action the waste steam from the engine is conducted into them. Having been kneaded forcibly together in this manner for some hours —more or less according to the nature and thickness of the hides—the drums are thrown out of gear, and the hides drawn out. It is now ascertained that the work of absorption and of partial drying has gone on vigorously, and with uniformity, and that the hides not having yet attained the point of saturation, are ready for another supply of the paste and a second turn in the drums. Previous to this, however, they are hung up in an airy part of the room, so as to insure uniformity of color and of substance, which when perfected proves that the conversion of the gelatinous mass has been equal and complete. They are now ready, after a little more drying, for the operations of the currier, who finds that his work is considerably lessened in amount by the effects of the above process. The *Shoe and Leather Reporter* is authority for the above statements.

THE Nashawannuck Suspender Mills at Easthampton, Mass., are to close 18th inst.

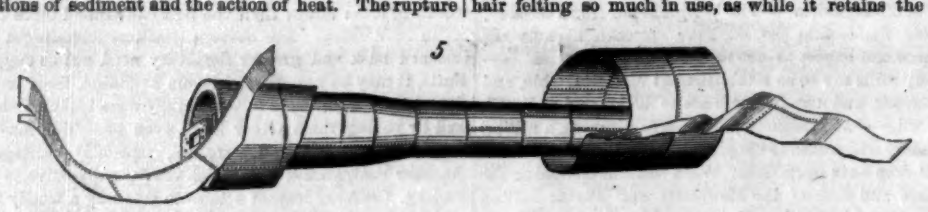
STEAM BOILERS—THEIR FORM, CONSTRUCTION, AND MATERIAL.

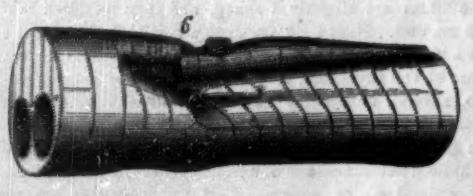
NUMBER FOUR.

As mentioned in the first of these series of articles, the haystack boilers were made sometimes twelve and fifteen feet in diameter without any internal stays. The bottom of the boilers were concave, somewhat like the bottom of an ordinary junk bottle only in a less degree. Where the bottom joined the sides the joint was strengthened by an angle iron hoop on the inside. Sometimes the outer circle of the bottom for a foot from the circumference was perfectly flat, and the rise of the bottom began at the inner edge of this flat ring. Explosions of this class of boilers have invariably occurred at the bottom, as seen in No. 1. This boiler was without stays having a diameter of fourteen feet. The force of the explosion tore the bottom off all around and rent it in two pieces, while the shell was thrown to a considerable hight and put out of shape by the fall. Another case, but a slighter explosion, is seen at No. 2, where a portion of the bottom gave way and the recoil of the steam and water overturned the boiler. It does not appear that corrosion caused the first of these explosions, but it was probably owing to the weakening of the sheets by alternate expansion and contraction of the bottom, which gradually but surely cut the angle iron around the rim. In the latter case corrosion might have caused the rupture, as the joint between the bottom and sides appears to have been left intact.



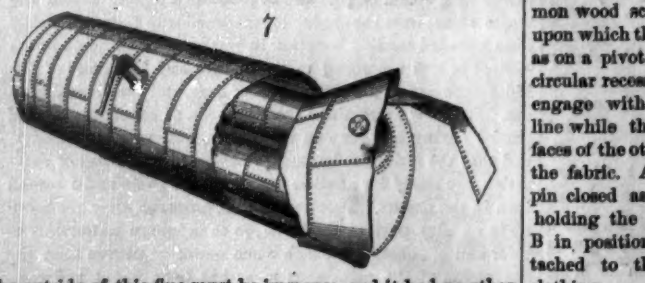
Plain cylindrical boilers have been justly considered a very safe form of boiler when properly set and kept clean. The form used in England has generally crowning or hemispherical ends which are probably much stronger than flat ends, and certainly stronger than flat cast iron heads so much used in this country both for plain cylinder and flue boilers. Yet these boilers do explode, and from their appearance after explosion would seem always to be weakened by corrosion. As in No. 3, they generally open first in a longitudinal seam over the fire where the plates have become deteriorated by the accumulations of sediment and the action of heat. The rupture extends to the sound seam beyond the bridge wall and in front to the head, and then runs up the transverse seams at either end of the longitudinal rent, opening the shell out on either side. Sometimes, however, the head blows off and the body of the boiler is thrown violently from its bed. This is often the case where the heads are of cast iron flat; or, the portion nearest the fire is torn without regard to the seams.





The boiler represented in the engraving was thirty-four feet long and five feet six inches diameter.

The single flue or Cornish boiler not unfrequently fails from the collapse of the flue by external pressure. These boilers are internally fired and the flue is of very large diameter proportioned to the shell. The one shown in No. 4 had a shell of thirty-five feet in length by seven feet in diameter, with a tube of four feet diameter. It is evident that the pressure on the outside of this flue must be immense, and it had no other resistance to offer but its cylindrical form and the strength of the material. Internal tubes, when of large diameter and used for flues, should be as capable of resisting external force as the shell of resisting internal strain. A convenient way of strengthening these flues is by rings. They may be of T-iron, or of plate iron the central portion rolled into a curved form so that a section would resemble a U reversed, with outward projecting flanges on each leg to receive the rivets. This form of ring will allow for expansion and contraction, which will be taken up by the ring and thus reduce the strain on the heads of the boiler. We gave an engraving of this method in our issue of Feb. 2, 1867.



The collapsing of a flue does not necessarily explode a boiler, the damage usually done being by the escape of water and steam. The formation of these flues to an oval as is sometimes practiced, is reprehensible, as any departure from a cylindrical form diminishes the power of the flue to resist external pressure. It will scarcely be credited that a Lancashire or two-flued boiler was collapsed so late as 1865 near Bury, Lancashire, England, by the external pressure of the atmosphere on the shell. It is shown in No. 6.

External corrosion is a not unfrequent cause of explosions. It is caused by leakage very often, and where the boiler is covered with brick work it is not always detected in time to prevent serious consequences. Even the tops of boilers will sometimes be perforated by minute holes, the plate being honeycombed. Covering the tops of boilers with ashes is any thing but a safe practice; the leakage, in conjunction with the corrosive solution from the ashes, speedily ruins the plates. Sand as a covering is a good non-conductor of heat, but it hides the mischief which may be continually going on. If a boiler *must* be covered, probably nothing is better than the hair felting so much in use, as while it retains the heat it permits the presence of moisture to be seen by its fibrous texture. It may be questioned, however, whether an uncovered boiler protected by a proper roof is not better than one closely covered in or lagged. It may cost more for fuel, but every leak could at once be seen and corrosion prevented in time.

Another cause of external corrosion is improper material for a foundation. Porous stone or other material which attracts moisture from the earth may rapidly corrode the shell of a boiler. An explosion from such a cause is shown in No. 5 where the shell was rent at the corroded part and the fracture continued spirally around the boiler. In No. 7 also is an explosion from a similar cause operating in a similar manner.

We shall speak further on this subject of corrosion, one of the most prolific causes of explosions.

WARD'S UNIVERSAL CLOTHES PIN.

"Life is made up of little things" and the clothes pin is one of those little things. We have in the engraving a representation of a clothes pin, cheap, simple, and easily handled. It consists of two pieces of wood fastened together by a common wood screw or rivet, upon which the pieces turn as on a pivot. The semi-circular recesses at one end engage with the clothes line while the plain surfaces of the other end hold the fabric. A, shows the pin closed as it is when holding the clothes, and B in position to be attached to the line and clothing.

Among the advantages claimed by the inventor are durability, as it cannot split nor come apart, having no strain upon one end which is not resisted by equal pressure on the other; cheapness, permanency on the line, as it cannot blow off or become loosened from the clothes, and the avoidance of freez ing clothes to the line, which endangers the tearing of fine and delicate fabrics. It is equally useful for dry goods and hardware dealers in exhibiting their wares, and also for photographers for drying their sheets.

It was patented through the Scientific American Patent Agency Feb. 19, 1867, by W. G. Ward For rights and for the pins, address Hiram Hughes, Savona, Steuben Co., N. Y.

KIPS AND ALLMENDINGER'S OILER.

The usual apparatus for oiling overhead shafting is simply a common oil can attached to a light rod of wood, which is an unhandy contrivance and liable to waste the oil. When a ladder is used the labor of oiling a long line of shafting is excessive and not unattended with danger. But the oiler herewith illustrated seems to be an excellent device for oiling open to none of these objections. The engraving is a section, A being the oil reservoir and also performing the functions of an air chamber. To the bottom of this is attached a pipe—quarter inch brass pipe is large enough—of sufficient length to reach the highest or lowest point to be oiled. At the bottom of the pipe is attached a bag, B, of india-rubber, by compressing which a jet of air is forced through the pipe. An extension of the pipe curves upward into the top of the oil reservoir. Rising through a stuffing box at the top of the reservoir is another pipe, C, which can be depressed to the bottom of the reservoir or elevated to the top, and is prevented from coming entirely out by a button on the lower end. A curved nozzle, D, can be attached to this pipe for overhead oiling. The lever, E, is pivoted to the pipe at a short distance above the compressible bag, B, and carries a conical plug that fits into a hole in the side of the pipe, having an elastic packing around it.

The operation is as follows:—In oiling overhead the curved nozzle is attached to the discharge pipe, which is pushed down to near the bottom of the reservoir. In the action of compressing the bulb, the handle of the lever, E, is depressed which closes the side hole in the pipe and makes it air tight. The air thus forced into the reservoir presses upon the surface of the oil and ejects it through the nozzle, D.

In oiling below the position of the operator the curved pipe is not required. The pipe, C, is drawn up and the hole in the side of the pipe left uncovered. The inlet of the air through this aperture presses the oil out of the discharge pipe in the usual way. The hole in the pipe may be closed by a slide valve or the finger placed over it, instead of using the lever in the manner shown in the engraving.

This invention was patented through the Scientific American Patent Agency, Feb. 12, 1867, by John Kips and William Allmendinger, who may be addressed relative thereto, at Morrisania, N. Y.

Improvement in Mirrors.

The manufacture of looking glasses and mirrors by coating with quicksilver, a protracted and life-destroying process, is to be dispensed with, according to a report by M. Salvetat, of the Paris committee on chemical arts, by a new invention which is to work a revolution in the decorative art, in windows and in mirrors, all at once. The French are always about to do something wonderful, and sometimes do it. The present wonder is a glass at once translucent and reflecting, so that it may be a window glass or a looking glass, or both, according to position. It is prepared by coating with a mixture of chloride of platinum, essence of lavender and a dissolvent composed of litharge and borate of lead. The other ingredients being then driven off by heat, the platinum is firmly deposited in an attenuated film, presenting a brilliant reflecting surface against the glass, yet transmitting a softened and agreeable light. The film is said to be perfectly fixed, and evidently may be applied for decorative purposes in endless forms and with either the most delicate or gorgeous effect, while its durability as against oxidation is of the first order. Thus a plate window may be at the same time a mirror, or it may be at once adorned and shaded with the pattern of a lace curtain which will show white toward the street and enliven the interior with its soft brilliancy, or the sides and effects may be reversed.

STEAM ROLLERS, weighing twenty tuns and driven by engines of twelve horse power, are used in Hyde Park for solidifying and smoothing the carriage ways.

Improved Gate for Carriage Ways.

The engravings give views of a convenient gate to be operated either from the carriage or on foot. The model acts well and appears to give promise of being equally effective as an ordinary sized carriage gate. Its operation is prompt, the working parts being strong and direct acting.

Fig. 1 is a perspective view of the gate closed, with its appurtenances. Fig. 2 is a view of the main working parts. By reference to the letters on Fig. 2 the operation of the gate can be readily understood. The gate is swung at one end to a post by ears in which pivots turn, the top one being seen plainly at A, Fig. 2. At the other end is a spring latch from which is led a rod, B, connecting with a forked, curved lever, C. Passing through the fork of this lever is a horizontal shaft turning in suitable bearings, having on one end a spur or chain wheel with which a chain, D, engages, the ends of which are attached to the ends of the elevated levers seen in Fig. 2. At the other end the horizontal shaft carries a bevel gear, which is not rigidly secured to the shaft but is actuated by a pin on the shaft traversing a semi-cylindrical slot in its hub. When by pulling upon either suspended lever, the shaft, through the medium of the chain, is caused to rotate, the first action is to engage a pin on the shaft with a curved portion of the forked lever, C, throwing it back and by the rod, B, drawing back the spring catch and unlocking the gate. In the mean time the bevel gear remains stationary until the latch is withdrawn, when the pin which gives it motion engages with one end of the annular slot and causes it to turn, when it moves the segmental gear, E, and swings the gate around to a right angle to its former position, and its latch end catches in the locks seen in Fig. 1 on the upright posts which support the opening levers. The machinery is defended from the weather by the cap on the hinge post and a metallic covering over the segmental gear, E.

It will be seen that always, from whatever direction a person approaches, the gate, when opened by pulling the outer end of the suspended lever down, swings away from the operator, so that no annoyance can be caused by having the gate move toward the horse if the person is in a carriage or on horseback. After passing through, the gate can be closed by pulling on the opposite lever, the action of which liberates he catch which holds the gate in an open position.

This gate was patented through the Scientific American Patent Agency July 3, 1866, by Charles Dixon and S. H. Close, of Port Byron, N. Y., who will answer all communication relating thereto.

DIXON & CLOSE'S CARRIAGE GATE.

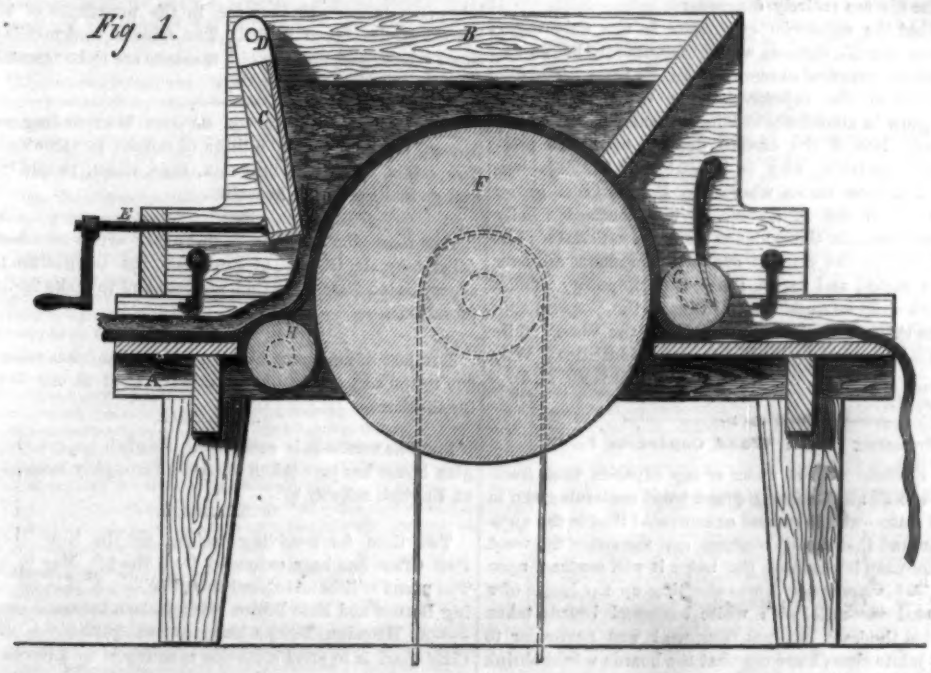
COMSTOCK'S LUMBER WAGON RACK.

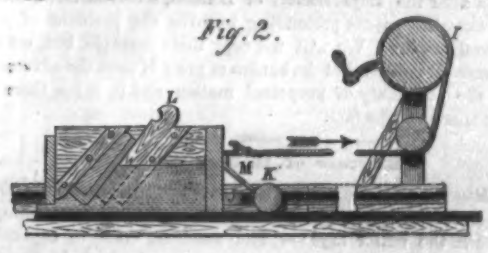
Our attention has been called to some errors in the description of Comstock's Lumber Wagon Rack recently published. The engraving is perfect and the working of this improvement can readily be seen when it is understood that when the rack is set for loading, the forward and middle rollers rest upon the forward bolster and center cross bar to frame, and the hind roller drops behind and below the hind bolster, the load resting upon the two forward rollers and the hind bolster. The chains, C C, in connection with the crank and shaft are used to bind the load and also in connection with the ropes and hooks connecting the two hind pairs of stakes to move backward the forward pair, and forward the hind pair, which motion raises all the rollers from the frame and discharges the load, leaving it in a compact pile and without breakage or damage to lumber.

Machine for Spreading Cement on Flexible Fabrics.

The machines shown in section by the engravings are intended for spreading a coating of cement on the surface of textile fabrics, cloth, canvas, paper, etc., for roofing and other purposes. Fig. 1 is a vertical transverse section of the spreading machine as operated by a rotary movement and intended to be used for factory work. Fig. 2 is a section of the spreading machine as operated by a horizontal movement and intended to be used to spread the cement directly on the roofs, etc. In Fig. 1, A represents the main frame which supports a detachable hopper, B, held to the frame by hooks. The side, C, of the hopper is pivoted to it at D, and thus serves as a gate to regulate the flow of cement or composition from the hopper. To the inner side of this gate, C, is attached a metallic plate termed the trowel, which is adjustable to or from the fabric by the screw, E. F is a large drum or cylinder, around which the fabric is passed, to be carried under the trowel. This fabric is held close to the drum by the pressure roller, G, operated by a spring. On the opposite side is the roller, H, which receives the prepared canvas from the drum and delivers it to an endless carrier or a table of a desired length. The thickness of the coating can be regulated by simply screwing up or unslacking the set screw, E, and it will be seen that as the fabric passes around the drum the convex surface of the latter expands the cloth so as to open the interstices, thereby permitting the cement to penetrate and adhere more tenaciously to the fabric. On this rotary machine, if driven only by hand, from 10,000 to 15,000 feet of canvas can be spread in a day, and this is intended for the use of factories where the roofing canvas is prepared in large quantities.

But where a machine is wanted to be used on roofs, etc., to spread the cement on the fabric *in situ*, then the arrangement as represented in Fig. 2 is applicable, in which the hopper instead of being stationary, as in Fig. 1, is caused to advance over the fixed fabric by means of the rope and windlass, I. The hopper is confined to a rectilinear path by the cleat, J, which enters a longitudinal groove, the fabric being kept straight by a pressure roller, K, while the trowel is secured by the wedges, L, and the canvas is prevented from moving by the bar, M, whose ends are secured in the groove. This machine can be used on roofs or other places where cement-spread canvas is needed, and can do more and better work than twenty or thirty hands. Patented Sept. 4, 1866. For further information address J. H. Pulte, No. 293 Walnut street, Cincinnati, Ohio.





PULTE'S CEMENT-SPREADING MACHINE.

Bath for Tempering Steel.

G. J., of Me., a practical forger, sends the following recipe for a bath for tempering steel: Water, 1 gal.; spirits of niter, 1 oz.; salammoniac, 1 oz.; white vitriol, 1 oz.; alum, 2 oz.; table salt, 8 oz.; saltpeter, 1 oz.; lard oil, 1 pint.

Mill picks should be heated a dark cherry and cooled quickly in the bath. Taps and dies heated to cherry red and drawn to light blue; wood tools drawn to copper color. Springs should be heated to a dark (black) red and drawn to dark blue. Marble engraving chisels, to a light yellow. Cutlery, however thin the blades, may be tempered at one heat without springing or fire cracking.

Petroleum in the U. S. Navy.

We see it loosely stated that petroleum is now in successful experimental use on board the U. S. steamer *Palos*, where it has been demonstrated that it will do the work of the best anthracite coal with about one sixth of its weight and bulk and less than its cost. Professor McGauley, on the other extreme, calculates the heating power of petroleum as nearly one and a half times that of English coals, by weight, reckoning from the constituents of each. The London *Standard* has asserted that it will raise three times as much steam as can be raised with coal. Mr. Richardson's experiments, probably the most trustworthy yet made, have shown with imperfect combustion in an ill-adapted boiler, a little over twice the effect of coal. There is a good deal of confusion, and some exaggeration, between the extremes. The theoretical conclusions of Professor McGauley, however, seem hardly of any practical worth, although upon them he founds what he considers a demonstration, that deducting the difference against petroleum in bulk, which he makes 26 per cent, from the difference in its favor by weight, which he sets at 38 per cent, there is only 12 per cent advantage, to offset the heavy disadvantage in cost. Actual experiment alone can show what each fuel is capable of doing in its peculiar conditions and by our modes of combustion. We shall look with interest for more precise and authentic information from our navy. It is in this country that petroleum can be used to advantage if anywhere, and here if anywhere the ingenuity will be found to use it to the best advantage.

THE Chicago Egg Preserving Co., with a capital stock of $50,000, have signed articles of association.

Correspondence.

The Editors are not responsible for the opinions expressed by their correspondents.

Perpetual Motion.

Messrs. Editors:—From time to time many scathing articles have appeared in your Scientific American on the subject of "Perpetual Motion," the last which has come to my notice being in No. 16, Vol. 16, date April 20th under the head of "A Terrible Invention." You have always persistently endeavored to convey to the minds of the readers of your valuable paper that perpetual motion is an impossibility. Now I would ask you, have you ever seriously considered the principles involved toward the working of such a machine, or have you ever tried to invent or discover the means by which a machine should start itself, and create within itself a power to sustain itself in motion until the machine itself, or some of its parts be worn out? If you have, why not give your experience to the world? But if you base your opinion upon the verdict which others who have tried it and failed have given, without examining for yourself, I think the least you say about it the better. Works on "Natural Philosophy" generally give their opinion thus: "Perpetual motion is deemed an impossibility in mechanics, because action and reaction are always equal, and in contrary directions." Now here is a reason, but one which will not satisfy me. I have made a study of the same subject for the past thirteen years, making different machines but none hitherto would work, and it has been my object after a failure to endeavor to find out the cause of the failure, and by pursuing this course, not only to satisfy myself, but to give, after my experiments, my experience to the world. I am now constructing a machine which will be my last; for if the one now being made and invented by me does not work, I shall then give it up as useless, but still, until I prove tothe contrary, I cannot consider it an impossibility. You say, page 253 of current Vol. April 20th. "A machine generating force in excess of that provided to impel it, if such a thing were possible, could never be stopped by the power that started it, and would become like the wonderful self-acting cork leg in the song, the master and not the servant of its maker." Now, gentlemen, you are in error; remove the firm cause, the compressed air, and the whole would obey the will of the master.

You have said time after time that it is an impossibility. Give me, give the world through your paper, your reasons scientific or otherwise, why the feat cannot be performed. I am in quest of light on the subject and wish if possible to clear away the mist that envelope the minds of many of my fellow men. W. J. A.

Philadelphia, Pa.

[We publish our correspondent's letter as one more evidence of the hallucination of strivers after a mechanical impossibility. Evidently he is a man of culture, an independent thinker, and probably is as conversant with the laws of mechanics as we; but nothing will serve him but a demonstration, and hardly that; for according to his own statement he has made several machines during thirteen years of study and experiment, and is preparing another. Neither the well-established and immutable laws of nature, the innumerable failures of others, nor even his own disapointments have sufficed for him.

Of what avail would be the recital of our failures in the discovery of a perpetual motion, if we had ever made the attempt? Of what avail to re-state reasons which for two thousand years have withstood all attempts to controvert them? Shall we enter into an argument to prove the earth to be the center of the solar system, or that the attraction of gravitation exerts its force from center to circumference?

When our correspondent can totally annihilate friction, overcome at will gravitation, prevent the adhesion of parts, and preclude the conversion of some of the mechanical force exerted into heat; when he can add to the force generated or transmitted through any part, or make a machine yield more work than the amount of the power applied, and when he can gain velocity except at the expense of power, it will be time enough for us to fill our columns with speculations on an impossibility.

So long ago as 1775 the French Academy of Sciences, and soon after the Royal Society of London, resolved never more to examine papers pretending to solve the problem of perpetual motion. We will not copy their example, but we respectively submit that the burden of proof is upon the advocates of the possibility of perpetual motion, and it is for them to demonstrate the fact.

Rupture of Hollow Cylinders.

Messrs. Editors:—I noticed in your issue of March 30th, page 201, an item of correspondence from Cincinnati, Ohio, in which the writer says:—"The received error to rupture a cylindrical boiler by internal pressure," which is "as the pressure on a space equal to the diameter instead of the semi-circumference," has been previously noticed by him in the Scientific American, but in the article in question presents a clearer view of the opposing theories.

He further declares in substance, that "by the irrefutable law of statics, the force to rend asunder" a side of a cylinder is equal to the total normal internal pressure upon a quarter circumference. In many cases in statics, resolved forces (which our correspondent has lost sight of for the moment, although evidently posted in the principles of statics) are considered as well as the primary forces from which they are resolved. This one fact I think will lead him out of his difficulties and save him the trouble of further diverting from the truth the minds of your readers.

"By the irrefutable law of statics" the energy to tear asunder the side of a cylinder subjected to internal pressure is not equal to the total normal pressure upon a quarter circumference, but it is equal to the sum of all the elements of normal pressure acting on a quarter circumference resolved in the direction of the rupturing force considered, acting at one extremity of the quarter circumference. This will be found equal to the pressure upon a space equal to the radius, of the same length as the cylinder.

In the second volume of the Journal of the Franklin Institute for 1863, under "Suspension Bridges—A New System," I gave the substance and proof of the following theorem:—"The tension upon a normally pressed arc is uniform throughout, and equal to the pressure at any point of the arc multiplied by its radius of curvature."

An arc of the cylinder of any breadth being a normally pressed arc, it follows from the above theorem, proved independently of the question at issue, that the tension or force of rupture at any point is equal to the pressure multiplied by a radius, or what is the same thing the pressure on a space equal to the radius.

Be it sufficient at present to simply further state that all the great authors on mechanical engineering, such as Fredgold, Professor Rankine, etc., are willing to accept and abide by the results of the "irrefutable law of statics" when correctly applied, even when the result follows from general principles established independent of the problem. S. W. Robinson.

University of Michigan.

Milk Sickness.

Messrs. Editors:—In looking over the Scientific American, April 27, 1867, I find an article headed "Milk Sickness." As this question is now agitating the minds of the people living in the affected districts, it would not be amiss in me to say a few words in regard to the cause of the much dreaded malady. My observation and experience upon this singular malady reach back as far as 1856, and during this time I had frequent opportunities of studying its locality, origin, symptoms, treatment and anatomical characters. I, for one, will be greatly indebted if they prove satisfactorily that the *Eupatorium Ageratoidis* is the *fons etorigo* of this disease. And here let me ask, why should we endeavor to limit the cause of this disease to one single agent? In addition to the plant already mentioned, I have used the *rhus toxicodendron* (poison oak), and *rhus vernix* (swamp sumach), upon animals with the same effect, producing symptoms precisely alike. The majority of physicians concur in the opinion that it is a vegetable poison, but no satisfactory account of its nature has ever been given. Some say that it is an ergotized grass, or the combination of vegetables, forming a chemical change within themselves. Others claim that the *rhus toxicodendron, rhus radicans, rhus vernix, champignon* and even the harmless *caltha palustris*, are the sole cause of the disease. Every one who has lived in the milk-sick range, knows that the poison exists in circumscribed districts. These locations may contain one or hundreds of acres. It is found upon the hills, of soil of an inferior quality, and upon the richest vegetable mold of river or creek bottoms. These isolated locations, which produce the milk sickness, are generally well timbered, although I have seen these affected districts on open prairie. One fact is clearly known: where these localities were once noted for their virulency, when cleared or cultivated the disease entirely disappears.

To say that the *eupatorim ageratoidis* is the only vegetable that causes milk sickness would undoubtedly be an expression without practical observation for its basis. The different varieties of the *eupatorium*, and especially the *E. ageratoidis*, grow in abundance in Pennsylvania, Iowa, Kansas, Nebraska, etc. Now if the disease depends upon the presence of this vegetable, why is it that milk sickness was never known in these states where the *E. ageratoidis* grows in abundance? If the *E. ageratoidis* was confined wholly to the affected districts, the evidence would be conclusive: but we find this not be the case: it grows in abundance all over the western states, and cattle graze with impunity amidst it. The milk sickness could not be owing to the *E. ageratoidis*, inasmuch as this plant grows throughout the West, while the disease is perseveringly limited to certain localities. Why is this? H. M. Keyser, M. D.

Momence, Ill.

Freezing Green Wood Contracts It.

Messrs. Editors:—That water or sap expands upon freezing is plain to all: but freezing green wood containing sap in its natural state—will it expand or contract? that is the question. I contend that it will contract, and the softer the wood and the more sap it contains the more it will contract upon freezing. A few years ago I was sheeting up the inside of a newly erected saw-mill with white basswood boards taken directly from the saw, but not frozen. I was particular to make the joints close, knowing that the boards would shrink on seasoning. In the evening following the weather changed to severe cold, and on going out to my work in the morning judge of my surprise at seeing cracks that I could put my fingers through, where only the evening previous were close joints. When water from the falling rain becomes lodged in the cavities of standing trees, let the quantity be ever so small, upon freezing it is apt to burst the timber, and upon thawing out, the water will work its way down, then freeze and expand again. In this way I have seen trees that had split from top to bottom, but do not think that I ever saw a tree that had burst from freezing the sap as it naturally exists in the wood. If such a thing were possible it would be next to impossible for timber to grow in cold climates. I should like to hear from others upon the subject. D. Millard.

Leonidas, Mich.

[The drying effect of a freeze in porous fabrics, so well known to every housewife, should be taken into account in this connection.—Eds

Editorial Summary.

Maine Silver Lodes.—A letter from Bangor, which reads like exaggeration but professes the most sober information, states that five parallel lodes of argentiferous galena, some parts producing 25 to 33 per cent of copper, have been opened near Foxcroft, to a length of about fifty feet and a depth of about twenty-five feet, with increasing thickness as they descend. Assays show the ore to contain $230 to $350 worth of silver to the tun. An equally high story is told of the Guilford ore. Undoubtedly culled specimens were assayed, if there is foundation of any kind for the statement.

Pacific Railroad Ties.—The Union Pacific Railroad, by way of Omaha westward, passing through a country very deficient in wood and water, has thus far had to be laid upon cottonwood ties or sleepers. To fit this soft wood for the service required, it has been necessary to treat the ties with a solution of zinc, in a vacuum by which the pores were first emptied of their natural contents. The zinc, penetrating the pores, is said to give the wood almost a metallic appearance and weight, and secures its durability.

Peat Illuminating Gas.—At the Glenn's Falls Gas Works, Troy, N. Y., the experiment has been made of substituting peat taken from a bed about three feet below the surface, for coal, with the following satisfactory results. One hundred and fifteen pounds of dried peat yielded 78 feet of gas, or 5·81 feet of gas to the pound, while the best coal makes not more than 4·41 to the pound, the price of the peat being much less per tun than that usually employed in the gas manufacture.

The Growing Sugar Product of the Sandwich Islands gives considerable employment to machinists. The Honolulu *Commercial Advertiser* describes the eleventh sugar mill turned out within a short time at the works in that city, as a massive piece of workmanship which in the opinion of good judges could not be excelled in any of the machine shops of the old world. The rollers weigh 6000 lbs. each. Three more of these machines are building at the same works.

Recreations of a Philosopher.—Professor Doremus once placed a linen handkerchief in the explosive condition of gun cotton, and threw it into the wash. Bridget washed, dried, and sprinkled it ready for ironing, without a suspicion of its character. The moment she placed the hot iron upon it, the handkerchief vanished into thin air, nearly frightening the poor girl out of her senses. Had this occurred an age ago, the professor would have passed for a "limb of Satan."

Water-Proof Packing Paper.—The following is a German recipe: Dissolve 680·4 grammes (about 1·82 lbs.) of white soap in a quart of water. In another quart of water dissolve 1·82 oz. troy of gum arabic, and 5·5 oz. glue. Mix the two solutions, warn them, and soak the paper in the liquid. Pass it between rollers, or simply hang it up to drip, and then only at a gentle temperature.

Orders have been received at the Springfield Armory for a large and immediate increase in the production of breech-loaders of the latest model. The force of workmen is to be greatly enlarged, and the old muskets are to be remodeled at the rate of 500 or 600 per day.

The English trade in coal-tar dyes is expanding, and we import of them a half million of dollars, in value annually. The colors, which are magenta, blue, violet, purple, yellow, orange and green, are beautiful.

The mastodon remains, from Cohoes, are to be mounted at Albany by Mr. Gilbert, of Rochester, the Legislature having appropriated $2,000 for that purpose and to make further explorations.

The fact of next year being a "leap year" has added £13,000 to the cost of the British army. That is one day's pay for the forces.

Sic Transit.—It is said in the English papers that a Belgian house has just taken an order for eighty locomotives for an English railway!

The time for receiving designs for the New York Park Post Office has been extended from the 8th May to June 1st. The plans will be exhibited in public.——A plan for connecting Boston and East Boston with an iron tunnel is canvassed. ——At Herndon, Nev., a hotel to cost $100,000 is proposed. Cincinnati is to erect a marble monument to Lincoln.——Sir Robert Smike, one of the most noted British architects, is dead, aged 87.——Parties in Albany have purchased, at the head of State street, for $147,000, land on which they will erect a $750,000 six-story marble-front hotel and opera house combined. The new hotel will contain more rooms than any hotel in America.——A wrecking firm of Norfolk, Va., have commenced preparations for raising the hulks of the two seventy-four gun ships *Delaware* and *Columbus*, which were sunk by the rebels at the Gosport navy yard in 1861.——The French Exhibition building has been sold to a Russian company, who are to take possession Nov. 1st, and re-erect the same at St. Petersburg.——It is proposed to build the new State Capitol, at Albany, of a handsome light-colored granite, to be had cheap in Saratoga County.——The new banking building of the New York Park Bank, Broadway, is to have a kitchen underneath for providing mid-day meals to its employés.——It is said that George Pebody sawed wood for a night's lodging at Concord, N. H., fifty years ago.

Recent American and Foreign Patents.

Under this heading we shall publish weekly notes of some of the more prominent home and foreign patents.

PISTON-PACKING RING.—Charles H. Clark, Wilmington, Del.—The object of this invention is to provide a self-adjusting packing for the pistons of steam engines by which the pressure around the cylinder shall be equalized and the piston maintain a central position without undue pressure on the rubbing surfaces.

HOLLOW AUGER.—George E. Booth, Seymour, Conn.—This invention consists in a device by which the tenons of the spokes for wagon wheels and tenons for other purposes may be accurately and expeditiously made by revolving an auger in a lathe or by a hand brace, the main feature of the invention being in the manner in which the cutters are constructed and adjusted.

HOT-AIR FURNACE.—J. A. Vanburen, South Troy, N. Y.—This invention relates to the manner in which the heat-radiating surface of a hot-air furnace is increased so as to utilize the fuel and properly distribute the heated air.

JOINT FOR STOVEPIPE.—O. M. Pillsbury, Claremont, N. H., and D. L. Milliken, Brattleboro, Vt.—This invention relates to a new and improved manner of securing together the sections or lengths of stovepipe whereby a stovepipe may be readily put up and taken down and the sections or lengths firmly connected together, very close or tight joints being obtained which will effectually prevent the escape through them of either smoke or fire.

MACHINE FOR MAKING NUTS AND WASHERS.—Andrew Emerson, New York City.—This invention relates to a new and improved machine for making nuts and washers, and has for its object the forming of the same with angular or sharp edges and with smooth surfaces or sides so as to have a finished and neat appearance. The chief difficulty attending the manufacture of nuts by machinery is the giving to them a smooth finished exterior and sharp angular corners. Heretofore there has always been a rough surface and the corners rounded in a greater or less degree, a result fully obviated by this invention.

CULTIVATOR.—Edmund H. Knight, Unadilla, Mich.—This invention relates to a new and improved cultivator for general purposes but more particularly adapted for cultivating crops grown in hills or drills. The object of the invention is to obtain a device for the purpose specified which may be manipulated with the greatest facility by the rider and driver and which will admit of the shovels or teeth rising when meeting with obstructions so that they may readily pass over the same and thereby avoid any parts of the machine being broken or injured thereby.

CULTIVATOR.—J. H. Allison, Eureka, Ill.—This invention relates to a new and improved device for cultivating young corn and other crops grown in hills or drills, and also for harrowing in small seeds.

POST-DRIVING MACHINE.—C. T. Fitch, Harbor Creek, Pa.—This invention has for its object to furnish a cheap and convenient machine for driving fence and other posts.

ATMOSPHERIC RAILROAD.—A. H. Caryl, Groton, Mass.—This invention relates to a new and improved means for propelling railroad cars through the medium of compressed air, and is designed for city or street railroads, and to supersede draft animals or horse power now employed for such purpose.

JOINT FOR CHIMNEYS.—Marvin H. Kelsey, Red Bank, N. J.—This invention relates to a new and improved joint to be applied to chimneys where they pass through the roof of a building in order to prevent leakage between the chimney and roof. The object of the invention is to obtain a simple and economical device which may be readily applied and which will effectually prevent leakage around the chimneys, whether the roof be of shingles, slate, tin, composition or other material.

CHURN POWER.—John Christley, Slippery Rock, Pa.—This invention consists in the combination with a walking beam of a treadle the latter being connected to the former by a pendulous arm so that reciprocating motion can be imparted to the dasher rod which is attached to one end of the walking beam either by moving the opposite end of the beam up and down, or by operating the treadle, or by directly revolving the horizontal driving shaft by means of a crank or pulleys or otherwise.

HORSE-SHOE.—C. Weitman, Hazelton, Iowa.—This invention relates to a new and improved manner of securing calks to the shoe whereby the former may be readily secured to and detached from the latter and new calks therefore applied whenever required, without detaching the shoe from the hoof.

CARRIAGE CLIP OR THILL COUPLING.—Edwin R. Powell, Cambridge, Vt.—This invention has for its object to furnish an improved thill coupling so constructed and arranged that the thills or pole may be shifted easily and quickly, and which will at the same time be perfectly secure and free from rattling.

RAILROAD-TRACK CLEARER.—Watson King, Springfield, Ill.—This invention has for its object to so improve the construction of cars for running upon horse and other railroads that the cars may clear and clean the track for themselves by removing obstructions and thereby preserving life by rendering it impossible for any one who may have accidentally fallen upon the track to be run over by the wheels of the car.

SPRING JACK AND COUPLING FOR WHEEL CARRIAGES.—Thomas De Witt, Detroit, Michigan.—This invention has for its object to furnish an improvement in the construction of the jack or supporting springs which connect the half elliptic springs of a carriage to the axle.

MACHINE FOR FORMING BOILERS FOR COOKING STOVES.—Elisha S. Sackett, Monroe, Wis.—This invention has for its object to furnish an improved apparatus by means of which the bodies of sheet metal boilers for cooking stoves may be formed conveniently and accurately.

TOBACCO CUTTING MACHINE.—J. W. Crossley, Bridgeport, Conn.—This invention relates to a new and improved machine for cutting tobacco for chewing and smoking purposes. The invention consists in a novel manner of arranging and operating a knife whereby a drawing cut is obtained, and also in a novel feed mechanism for feeding the tobacco to the knife, all being constructed and arranged in such a manner that tobacco may be cut for the purposes specified with a moderate expenditure of power, in an expeditious manner, and finer or coarser as may be required.

CHURN.—Stephen Ballard, Sen., Sullivan, Ind.—This invention has for its object to furnish an improved churn by means of which the churning may be done very rapidly and thoroughly.

MEDICAL COMPOUND.—Dr. James A. Willis, Cherry Valley, N. Y.—This compound is intended for the removing and curing of bony substances in horses, such as ringbones, spasms, splints, etc.

ORGAN PIPE.—E. B. Andrews, Osborn Hollow, N. Y.—The object of this invention is to so construct the pipe that its tone cannot divide from one key to another, whether the pressure upon the bellows be more or less.

MOP HEAD.—John A. Wilson, Spencer, Mass.—This invention consists of a head or holder for a mop, provided with rollers suitable for wringing the same, when the mop is so hung to the head that at such times as is desired it can be drawn around and between the wringing rollers, without touching it with the hands.

WATER HEATER FOR STEAM ENGINES.—Peter M. Kafer and Joseph M. DeLacy, Trenton, New Jersey.—The object of this invention is to facilitate the extinguishin gof fires in cities and towns by supplying the steam fire engine boiler with water already heated to near the boiling temperature before it is started from the engine house.

WINDOW FASTENING.—Philip Verbeck, Neenah, Wis.—This invention relates to a new and improved fastening to be applied to the sashes of windows for the purpose of securing the same at any desired point within the scope of their movement, securing them when closed and preventing them from being either raised or lowered when secured in a partially raised or open state.

STEAM CONFECTION PAN.—G. H. Cross, Montpelier Vt.—This invention consists in arranging a funnel-shaped pan with a false bottom, in a suitable frame the shaft (or what would be the neck of the funnel) stands in the frame at an angle about 45°. The lower portion of the pan forms a steam chamber, and the funnel is revolved over a fire by suitable gearing.

ROOFING.—Seymour Pratt, Fayetteville, N. Y.—This invention consists in constructing a roofing of hydraulic cement mixed with lime and sand, this composition being pressed into square or other proper shaped blocks or tiles and laid, when in a set or dried state upon boards or lath nailed to the rafters. The cement blocks or tiles are, when laid upon the boards or laths, cemented together by and laid upon the same material in a plastic state as the blocks or tiles are made of.

SPIKE HOLDER.—Edwin W. H. Cooper, Hartford, Conn.—This invention consists in the arrangement of a truncated wedge in combination with a socket intended to receive the spike, and formed of two clamping jaws in such a manner that by the action of said wedge and clamping jaws the spike can be firmly retained in position, and all the disadvantages are obviated which arise if the spike works loose and if said spike has to be driven into different holes in the sleeper. With the clamping jaws and the wedge a suitable shell and an additional strip of wood or other material are combined, for the purpose of securing the spike holder conveniently and securely in the sleeper or crosstie.

DRY HOUSE.—Judson Schultz, Ellenville, N. Y.—This invention has for its object to furnish an improved dry house so constructed and arranged that substances to be dried of different degrees of moisture may be kept separate, and so that each separate portion may be supplied with more or less heat and air as may be desired.

INTERFERING AND OVER-REACHING ATTACHMENT FOR HORSES.—Frank B. Doughty, New York City.—By this attachment, the interfering and overreaching of horses can be entirely prevented and permanently cured.

KNITTING MACHINE.—Mark L. Roberts, Chatsworth, Ill.—This invention consists principally in a novel manner of operating the thrower for needles. Also in so arranging the needle operator that its length of stroke can be adjusted and changed at pleasure.

STOVE.—Jonathan H. Green, Christainsburgh, Iowa.—This invention has for its object to furnish an improved stove so constructed and arranged that while answering all the ordinary purposes of a stove, it may have the additional advantage of being convenient for warming the feet when cold.

HARVESTER.—David Wolf, Lebanon, Pa.—This invention relates to a harvester which consists in a novel construction of the platform, whereby the cut grain may be readily discharged therefrom and kept free from the sickle as it is cut. The invention also consists in a novel means for discharging the cut grain from the platform and also in the means for connecting the platform with the main frame of the device, and in an improved ratchet and pawl arrangement for the driving shaft, also constructed and arranged that several advantages are obtained.

BLIND SLAT FASTENING.—F. R. Smith, Bennington, Vt.—This invention relates to a fastening to be applied to a window blind to hold the slats in a closed or partially closed state, and prevent them when closed, from being opened on the outer side of the blinds when the latter are shut.

FIRE ESCAPE.—Alfred Rigney, New York City.—This invention relates to a fire escape, which is held in a carriage, and can be transported to any desired place, like a fireman's ladder. It consists mainly of a flexible ladder, the side pieces of which are made in sections, hinged together one round being in each section. The ladder can thus be easily wound around a horizontal drum or shaft, contained in the aforesaid carriage. On the hinged sidebars between the rounds, are arranged slides which fit close around the side bars, so as to remain in any position in which they may be placed.

HOT AIR FURNACE.—E. H. Camp, Jackson, Mich.—This invention relates to the manner in which the heat radiating surface of the furnace is increased, and to the manner in which the products of combustion are made to return through the fire box in a flue.

GAS BURNER AND HEATER.—H. Y. Lazear, New York City.—This invention relates to certain improvements in the construction of gas burners for cooking and heating purposes, so that the flame can be thrown toward one common center, thereby intensifying the heat, which construction also allows of the introduction of an air tube for heating purposes, the flame surrounding the said tube and heating the air which passes through the same.

POWER HAMMER.—Thos. F. Preston, Pawtucket, R. I.—The object of this invention is to construct a power hammer in such a manner that the hammer will not flap about loosely, but that its motion will be perfectly steady, and that no shock will be communicated to the working parts above,

BEER AND MASH COOLER.—C. Wise and B. Loeffler, New York City.—This invention relates to an apparatus for cooling the worts in the manufacture of beer, but may be used with advantage in all kinds of distilleries and for other purposes. It consists in the use of a circular horizontal vessel, into which the heated mash is poured. In the center of the vessel a vertical shaft is arranged, which receives rotary motion from a belt or otherwise, and on which a number of wings are attached, in such a manner that by the same the vapors which ascend from the liquor are thrown aside and fresh air brought into their place, so as to rapidly cool the liquor in the vessel. The liquor itself is kept in motion by a set of stirrers, arranged on the revolving shaft, and by chains attached thereto, which prevent the settling of any residue and help to rapidly cool the liquor. The fan as well as the stirrer are arranged adjustable on the aforesaid shaft.

PAPER BAG MACHINE.—Gustav L. Jaeger, New York City.—This invention consists in the arrangement of a movable former made of tin or other suitable material, in combination with two or more movable flaps or wings, which turn the blank over the former in such a manner that by the former itself the blank is held in position, and a triangular or square paper bag can be made with little trouble and expense.

SPLICING, BURRING, BURNISHING, AND BLUING STEEL SPRINGS.—A. B. Doolittle, Hartford, Conn.—This invention relates to a machine which is intended to burr and burnish steel springs after the same have been hardened and tempered, and to blue them when burnished, all in one operation. To prevent the rivets which are used in splicing the springs from injuring the burnishing rollers, the ends of said springs are struck up so that the heads of the rivets are not allowed to come in contact with the burnishing surfaces.

BALANCED SLIDE VALVE.—Alfred Hobbs, West Cambridge, Mass.—This invention consists in forming the valve and valve seat of a steam engine in a semicircular form, whereby the downward pressure on the same is neutralized.

Answers to Correspondents.

CORRESPONDENTS who expect to receive answers to their letters, must, in all cases, sign their names. We have a right to know those who seek information from us; besides, as sometimes happens, we may prefer to address the correspondent by mail.

SPECIAL NOTE.—This column is designed for the general interest and instruction of our readers, not for gratuitous replies to questions of a purely business or personal nature. We will publish such inquiries, however, when paid for as advertisements at 50 cents a line, under the head of "Business and Personal."

W. A. T., of Kansas.—"Will it injure a rifle to fire shot from it?" Yes. The shot passes straight through the barrel and consequently across the edges of the rifling. Remember that a soft metal in rapid motion will wear away the hardest iron. You can saw a file in two by a disk of copper or lead revolved in a lathe.

W. E. G., of Pa.—Flour paste, well boiled alone or mixed with glue will serve the purpose of repairing the bellows of your melodeon.

J. J., of N. Y., made an induction coil for giving shocks which operated well at first, but soon lost all its power. Probably by rough handling it has lost its insulation, or the connections with the battery are imperfectly or wrongly made.

S. L., of Ohio.—The effect of magnesium with other metals is to render the alloy brittle. We are not aware that any alloy of magnesium has yet been made which is likely to prove valuable in the arts.

H. C., of Pa.—A good coach varnish or drying oil thinned with turpentine will be good to restore the luster of the iron work of your fireplace which has been dulled by the heat. . . . The yellow stains on the margin of engravings may be removed by a solution of hypochlorite of soda, commonly called Labarraque's solution.

P. C. M., of N. Y., plays the violin and finds that his hands perspire so much that the strings are soon worn out and the instrument is continually getting out of tune. There is probably no treatment of the strings which would satisfactorily answer his purpose. Any foreign matter put on the strings to render them perspiration proof might be a remedy worse than the disease. We suggest that he try finger stalls made of very thin india-rubber.

M. L. M., of N. Y.—You can extract the silver from old watch cases and similar alloys by dissolving in nitric acid, and precipitating chloride of silver with a solution of salt. The silver is reduced in a pure state by mixing the chloride with an equal weight of bi-carbonate of soda and smelting in a common sand crucible. . . . Napier's electro-metallurgy is a practical treatise. We are not acquainted with any book in English which treats especially of watch repairing or engraving.

A. M., of Pa.—We have seen speaking tubes several hundred feet long. A conversation without doubt might be carried on through a properly proportioned tube a mile or more long.

A. W. G., of Ohio.—The best conductors of heat are also the best conductors of electricity. There is no metal or other substance which at the same time is a conductor of the one and a non-conductor of the other. . . The substances which absorb heat most rapidly are the best radiators. The heating and cooling of any body take place in equal times.

W. B., of Pa.—"Will a one inch water-tight pipe, issuing from a head of 100 feet above the level of the sea, deliver water at the sea, when the pipe is carried over a hill, the top of which is 150 feet above the sea?" The pipe cannot carry the water on the principle of the siphon, for the siphon depends upon the pressure of the atmosphere which lifts water only thirty-four feet. In the case proposed the water is to be lifted 50 feet. Resort must be had to a force pump.

C. A. H., of N. J.—In the recipe to which you refer, for the word, parts' read 'pounds' and you will understand it.

D. W. S., of Mo.—In reply to your question relative to menhaden oil we reply that it is manufactured by C. F. and J. B. Henschoff, Bristol, R. I.

O. J. P., of C. E., asks if two cylinder engines do better work for a steamboat than a single cylinder of the same capacity as the two united. If the steamboat is driven by a screw two cylinders are required, if by paddle wheels one is sufficient and if of equal power is in our opinion, preferable on all accounts. The "dead points" you speak of are of no account in a paddle engine; the wheels act as fly wheels.

W. L. B., of Pa.—"If a water wheel be set in motion by water and is made of imperishable material would it be what we understand by perpetual motion?" No. Perpetual motion, as understood by scientists and mechanicians, is not simply a continual movement but an imaginary machine which produces its own power. Perpetual motion is really a perpetual humbug deluding and ruining its votories.

J. T. H., of Mass., asks whether the inventor of the "new dryer for raw oils" mentioned in No. 17 current Vol., desires to keep it secret or to sell. He advises him to advertise it. We do not know who the inventor is nor what he intends to do with his discovery. Perhaps the correspondent, A. W., who gave the statement can reply to J. T. H. and others who have requested the same information.

S. M. B., of Tenn.—We suppose the use of sand in taking a welding heat on iron is to preserve the outside from being burned before the interior portion is of the proper temperature. As a flux it also preserves the surface from slag the presence of which would prevent securing a thorough joint.

B. F. J., of Wis.—Iron and some other metals permanently expand by heat; at least they are expanded while hot. Probably the grate bars in your furnace were fitted when cold to touch the back and front. It would not be surprising, therefore, that they should bulge out your furnace front. You should allow at least an inch for expansion in grate bars of three feet.

H. C D., of N. Y., asks what are the component parts of a solder a very little harder than tinman's soft solder, something that will melt and flow by the blaze of a spirit lamp. Tinman's solder is lead, 1, tin 1. Probably the addition of a small proportion of antimony would increase the hardness and yet leave it fusible enough. Perhaps some of our correspondents can give a recipe.

F. L. C., of Md.—Cucumbers, cellery and lettuce contain oils which may be extracted by a solvent. The yield however would be small.

A. S., of N. Y.—"Jones' lamentable squeak (see page 298), can be stopped by putting a peg in the middle of the sole of his boot."

G. W. S., of Pa., argues thus: Steam is lighter than air, rises in the air and buoys up whatever contains it, consequently by reason of this lightness of steam, the pressure on the upper side of the boiler is greater than on the lower. The reasoning is fallacious. What makes steam rise in air is the upward pressure of the air. In a closed rigid vessel like a boiler, there is no pressure of the air and a tendency of the steam upward on that account. The weight of the steam moreover is an addition to the pressure on the bottom of the boiler.

R. B., of N. J.—Mr. Ansell the inventor of the fire damp indicator lives in England. A letter addressed to him at London, care of Wm. Crookes, Esq., will reach its destination.

A. J. B., of N. J.—A non-drying cement of great tenacity, useful in fastening together plates of glass so as to exclude the air, but which may be easily separated, is formed by adding fresh slacked lime to double its weight of india-rubber, heating to about 400 deg. F. when the rubber will be converted into a glutinous mass. A drying cement is made by mixing equal weights of such gum, lime, and red lead.

A. A. C., of N. Y.—The diapason, or tuning fork, as it produces at will an invariable note, is used for regulating the sounds of musical instruments, and also furnishes a standard for the musical scale. The tone denoted by the letter, A, is produced by 428 vibrations of air per second. Piano fortes are generally tuned below concert pitch, A 8, corresponding to 430 sound waves per second.

E. N. G., of Tenn.—The dimensions of the Albany boat, the *St. John* are; length 417 feet, width over all 80 feet, beam 30 feet. The engines are 32 inch cylinders and 15 feet stroke. Estimated horse power over 1000. She has accommodations for 700 passengers, is registered as 2,536 tuns burden, draws from six to six and one-half feet of water, and her speed is from 15 to 17 miles per hour. The *Mary Powell* averages 20 miles an hour, and on several occasions has made 27 miles. If the Mississippi steamboat makes 13 miles against a current of 9 miles per hour, if running down stream with the current in her favor, she would make 22 miles with the expenditure of the same amount of power.

W. S. H. Jr., of Pa.—We must receive indisputable proof that the Nicolson pavement is injurious to horses from its "rebound" before we shall believe it. We think the unyielding rigidity of stone pavements is one of its serious objections. We do not regard the Nicolson pavement as "essentially the same as a plank road," as in the latter case the grain of the wood is horizontal, the best position for springing, and in the former the grain is vertical, the proper position to secure firmness.

Business and Personal.

The charge for insertion under this head is 20 cents a line.

Wanted—location for Portable Saw Mill—steady sawing, from one to five years. Address Marion Lumber Company, Midway, Washington county, Pa.

Wanted to correspond with some person having a second-hand portable steam engine to sell, not less than 8 or 10 horse-power. Direct J. E., Rockwood, Ill.

C. J. Fay, Camden, N. J., wishes the address of all paper manufacturers, so as to correspond with them.

Device for Burning Coal Dust.

The question of economy in fuel is one that has for the past few years been growing in national importance. In the British Islands inquiry has already been started as to how many years their coal fields will supply the steadily increasing demands of the English factories.

In Germany, however, the limited supply has for a long time caused the inventive talent of the various nationalities, to be directed so as to obtain the most economical and perfect combustion. Mr. Ferdinand Braun, of Wiesbach, a member of the Royal Bavarian Engineer Corps, being appointed to the superintendence of a coal mine, very naturally had his attention drawn to the large percentage of waste slack or fine coal, which is found in all coal-mining regions.

This is at the present time not only a loss but a cause of expense to the miner, requiring labor to mine and haul to the surface; and also the occupancy of extensive tracts of land upon which it may be allowed to accumulate. Many attempts have already been made to use this material pressed in blocks with coal tar, refuse petroleum, etc.; but even allowing this to be practicable, it requires a large outlay for labor and machinery. Mr. Braun viewed this problem from another standpoint. His predecessors had accepted as a fact the form of furnace now in general use, and endeavored to so manipulate the fuel as to allow of its use in them, but his labors were directed to construct a form of furnace in which this waste material could be burned without any change in the fuel. The accompanying engravings show the furnace which he invented.

Fig. 1.

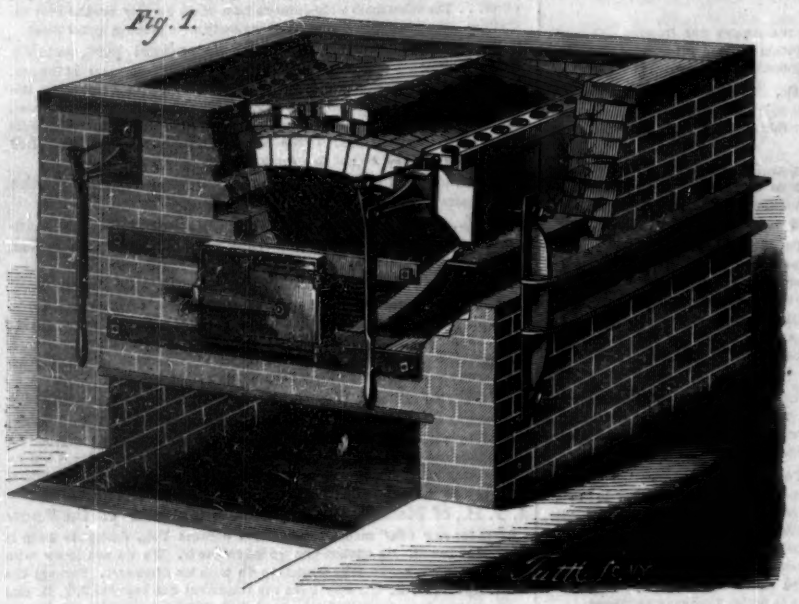
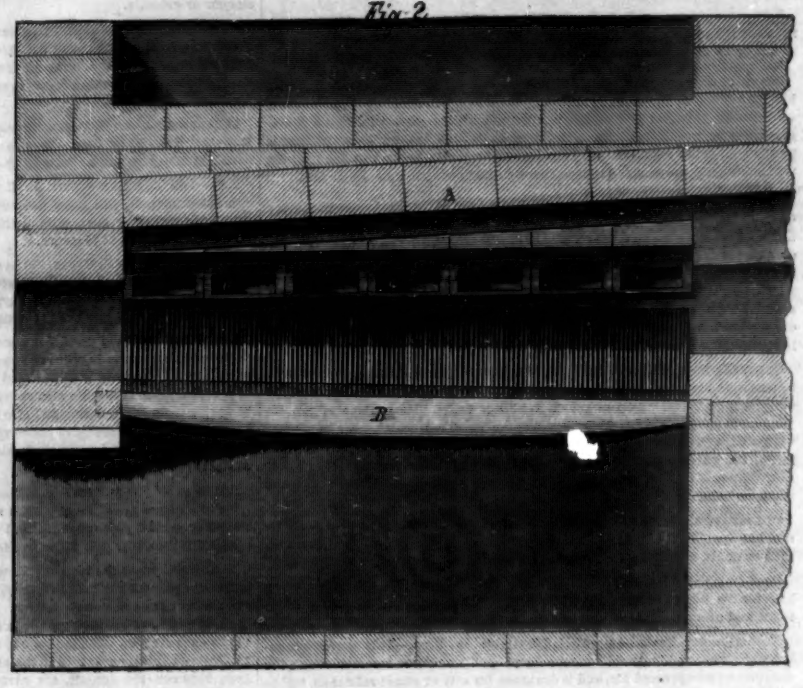


Fig. 2.



BRAUN'S BASKET GRATE FURNACE.

It is adapted for burning fine and dust coal, peat, sawdust, spent tan, etc. Fig. 1 is a perspective view of the furnace with a portion of the wall broken so as to show the hopper or fuel chamber over the arch, the passage through the skew backs in the arch, from the fuel chamber to the grate in the fire box, the inclination of the grates from the sides to the middle of the fire, the levers and slides for regulating the amount of fuel fed to the fire, the fire-box door, used only for cleaning the fire, and the arch of fire brick or other refractory material.

Fig. 2 is a section through the middle of the fire, showing the inclination of the arch, A, upward, and the inclination of the grate, B, downward, from the front to rear, also the feed passages, C, for the fuel, which are at intervals from the front to the back, at the spring of the arch on both sides of the furnace. To burn this fine material requires that it should be in a thin layer and evenly distributed over the surface of the grate. This form of furnace meets these requirements by a continuous automatic feed from both sides of the fire, throughout its whole length, the feed being caused simply by the law of gravity causing the fuel to fall through the feed passages and slide on the inclined grates.

The advantages of this furnace are burning an inferior and cheaper material, and by means of the radiated heat from the arch a perfect combustion is obtained. The saving in weight arising from this perfect combustion of fuel amounts in practice to twenty per cent, in addition to that from the lower price of the fuel.

A great desideratum for the bituminous coal regions is that the perfect combustion in this furnace allows no smoke to escape, thus furnishing an easy and available remedy for the dingy clouds of smoke which envelope so many of our large manufacturing cities.

The patent for this invention in the United States was obtained through the Scientific American Patent Agency, May 17, 1864. It has since been assigned to the Fuel Saving Furnace Company, of New York City, which has been organized with a capital stock of $200,000 for the purpose of purchasing said patent and doing all acts incident to the manufacture and introduction of the furnaces.

For further information call upon or apply to William Ennis, President, or J. W. Cole, Secretary, at the office of the Company, No. 205 Broadway, New York City.

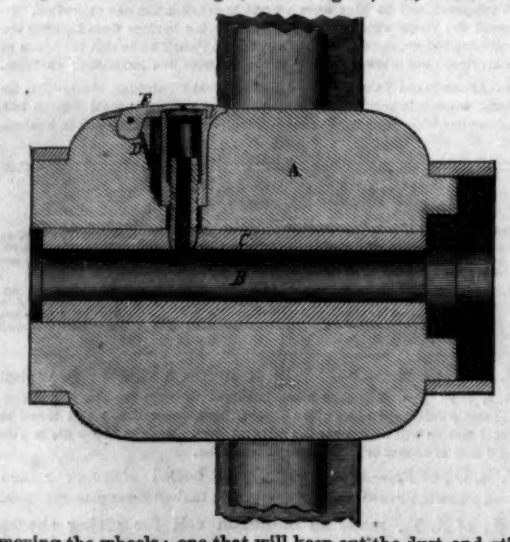
RELIEF OF THE CITY—ELEVATED RAILROADS.

The experimental half-mile section of the West Side and Yonkers Elevated Railway, for which the surveys have been already made in the lower part of Greenwich street, is to be the initiative, if successful and approved, of three lines conditionally authorized by the legislature, from the Battery to western, middle and eastern points in Westchester county The west side line runs through Greenwich street to Ninth avenue, and thence by the most eligible route by way of Kingsbridge to Yonkers. The eastern line proceeds through Pearl street, Bowery, Third avenue and between Third and Second avenues to Harlem bridge, and thence to New Rochelle. The middle line runs through Broadway to Sixty-fourth street, and thence to probably the east side of the village of Yonkers, where large tracts of most eligible building land await direct railway communication with the city to develop into great value both to present proprietors and the public.

These structures are to be supported on wrought iron columns in line with the curb stone, twenty-five feet apart. The track, which is to be of steel on a bed of india-rubber, will thus overlap the road and sidewalk equally. In the upper part of the city, right of way may be bought through the center of blocks, in the usual manner. Passenger stations will be provided, as far as possible by renting second floor rooms adjoining, with inside stairs and ornamental bridges conducting to the road, at intervals of from 1,500 to 2,500 feet. The cars are to be propelled by stationary steam power, imparted through a half-inch steel wire rope running between the rails. The estimated cost is from $300,000 to $500,000 per mile. After the experimental section is built, it is to be examined by three commissioners, two appointed by the Governor and one by the city authorities. Should the report be favorable to the road, not only as practicable but in no way interfering with the comfort of the community, or dangerous to life upon or below it, the companies shall then have the right to build the roads to Yonkers and establish a ferry over Harlem River. The construction of the Broadway road will require the consent of the Common Council.

CALKIN'S AXLE OILER.

The object of this invention is to obtain a ready means of oiling the axles of carriages, team wagons, etc., without removing the wheels; one that will keep out the dust and still be adapted to every size of hub by simple adjustment. It is a tube formed in two parts, one to slide or be screwed within the other to adapt its length to hubs of varying diameters.



In the engraving A is a section of a hub and B the axle arm on which the box, C, turns. The oiler is of cylindrical form and is let into the hub by a mortise, a suitable recess being made for the action of the lever cap and spring, D. In the upper portion of the tube is a smaller tube either screwed in or made to slide, and held in place by a set screw or other device. Preferably it is screwed in as shown in the engraving. By this means the tube may be elongated or contracted to suit the size of the hub. The cap, E, fits flush with the flange of the oiler when closed, and is held in position, either open or closed, by the spring, D. It is opened only to introduce the oil. The upper tube directly under the cap has a flanged annular recess in which is a disk of rubber, cork, or other elastic substance which prevents leakage of the oil or the introduction of dust. A small hole in the cap gives admission to air to force the oil to the axle.

This contrivance is perfectly simple, cheaply made, and easily applied. There are no detached parts to be lost and its operation is uniform and efficient. John H. Calkins and W. T. Young, of Troy, Pa., should be addressed for further information.

The Russian American Acquisition.

The following is the substance of information in regard to the Russia America, derived from Professor Baird, of the Smithsonian Institute:

Means of Information.—Has had two explorers in that field between one and two years, who returned last autumn, bringing a collection of specimens of natural history, extending from the British possessions to the shores of the Polar sea.

Climate, Temperature.—The coast from Prince of Wales Island to the entrance of Behring's Straits during the winter months is about the same as at the city of Washington. Little snow, much rain. During summer months, very foggy.

Timber.—Whole country well up to the northern coast heavily timbered, chiefly hard pine forests; small trees up to the very shores. Some of the islands heavily timbered with pine forests and dense underbrush; some of them destitute of timber, and covered with grass of luxuriant growth. The soil on the west coast produces excellent barley and roots, such as radishes, turnips, and esculents, such as lettuce, cabbage, etc.,

Animals.—Furred animals, such as sea otter, river otter, sable, furred seal, mink, foxes, black, silver, red, etc., in great great numbers. Red deer in the south, reindeer in the north.

Fish.—Herring, salmon, halibut and codfish abound in exhaustless numbers. Behring's sea and northward, great whales are very numerous.

Minerals.—Surface washings of gold have been discovered on the headwaters of streams, on the east side of the coast range of mountains. Geological developments the same on the west slopes. Native copper has been discovered in various places on the coast, and in the vicinity of Copper river, Iron ore of excellent quantity, now being smelted and worked by Russian artisans in repairing ships, etc. Coal is found in large quantities, used by the Russians for naval purposes, similar to New Brunswick coal, but not equal to Cumberland coal. Recent discoveries have been made of what is believed to be a better quantity of coal, not yet tested.

Inhabitants.—Five or six thousand Russians, and fifty or sixty thousand Indians and Esquimaux. The Esquimaux inhabit the coast on the Northern sea; are industrious, peaceable, and tractable, and live by hunting and fishing. The Inhabit the interior, and live by hunting, fishing, and trapping.

A Salt Mountain.—A communication read before the Scientific Association of San Francisco, describes a salt mountain resembling that in Louisiana, which became famous during the rebellion. It is situated near Muddy river, about 100 miles from the Great Bend of the Colorado, in Arizona; is about a mile wide by "several" miles long, and 400 feet high. The salt is nearly pure chloride of sodium. The old Spanish maps locate a "mountain of salt" in about the same position. Prof. Blake stated, as a remarkable fact, that he had found chloride of calcium by a recent analysis of salt brine brought from the neighborhood of St. Helens, Oregon

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VOL. XVI., No. 21....[NEW SERIES.]....*Twenty-first Year.*

NEW YORK, SATURDAY, MAY 25, 1867.

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CAUTION.

It has become necessary for us to state very distinctly that the Scientific American Patent Agency Offices are at No 37 PARK ROW, and not at No 39.

THE ASCENT OF MOUNTAINS.

Mountains, next the almost illimitable ocean, are the grandest objects on our planet—grand in their immensity and in the opposition they offer to all the efforts of man to overcome their obstacles to his progress. They constitute, more than the sea, the natural divisions between peoples and nations. Their barriers are so effective that on one side may be found one people with one language, one set of customs, one government, in short, one nationality, while on the other side is a different people, different language, customs, and government. Besides this they are the look-outs of the earth. From the top of a mountain peak the eye can take in hundreds of miles of territory on either side, comprising cities, harbors, villages, farms, the wilderness and the "wide, wide world."

But to get to this elevated stand-point, that is the rub. Mount Washington, a favorite summer resort for our tired citizens, rears its head only 6,226 feet above the sea level, yet its ascent is so fatiguing, and sometimes dangerous, that a carriage way has been built, and now a railway is in progress to enable those who most need the exhilarating atmosphere of our mountain tops, the weak, the feeble, and the work-exhausted, to rise from the sweltering valleys to the pure air of the mountain. We gave illustrations and a description of a plan for this purpose in our issue of March 5, 1864, Vol. X., No. 10. Following this example, it is stated that it is in contemplation to build a similar railway on the sides of some of the Alps, which rise from 9,600 to 15,700 feet. The completion of this enterprise, if ever undertaken, would diminish the "pride of strength" and the charm of success in overcoming obstacles, which add so much in the opinion of some to the *eclat* of a European tour; but it would be a great advantage to hundreds who now, from want of constitutional stamina and bodily strength, must content themselves with viewing the tops of the mountains from the humility of the valley, seeing but never possessing.

But cannot some cheaper method and safer plan be devised than an inclined railway, the cars on which are elevated by means of a stationary engine? On inclines not too rapid the ordinary locomotive could be used by the aid of the third or cramping rail, but on steep inclines as from the brink of one precipice to another no such means could be available to overcome the natural obstacles. As it is now, the attempts of engineers are not directed so much to finding a passage over the tops of mountains, or even hill, but to secure a way from side to side either by passing around the base or tunneling through the mountain. Both the elevated railway system and the tunnel are costly—costly in construction and in operation, and dangerous in use.

In our issue of March 30th we gave illustrations of a plan for overcoming these difficulties proposed by Dr. J. A. A. Fontaine of New York city. By reference to that copy of our paper his idea may be understood, but we will give a few of the principal details to enable our readers to form a more intelligent opinion of its merits. In the application of his idea to the ascent and descent of declivities the apparatus used is simple and comparatively inexpensive. It is merely a gas holder intended to neutralize the weight or gravity of the load, guided by wire ropes stretched from point to point, with which deeply grooved wheels engage. Attached to this gas holder or balloon, is a compartment for the reception of passengers or freight, which constitute the loads and is carried up the incline by the ascensive force of the confined gas, the wire ropes being the guide to the direction of the ascent. Arrived at the top of the incline, or the summit of the mountain, and the apparatus being ready to descend, a portion of the gas contained in the elevating reservoir is pumped back to the foot of the declivity into a proper receptacle, reducing the ascensive power and thus increasing the positive gravity, which power, when sufficient to overcome the negative gravity, will bring the æro self-mover back to its place of starting.

This device has not, as yet, been tested on a large scale, but there seems to be no obstacles to its operation for practical purposes which may not be overcome by the resources of mechanical skill and scientific knowledge. The inventor intends to make a practical application of its merits and demonstrate its value on the hights of Hoboken or at Hudson in a few weeks. The device is worthy investigation by our scientific men and capitalists.

THE MISSISSIPPI LEVEES.

The war did more in some instances than to temporarily depress industry and destroy the works of the husbandman. The effects of the ruin wrought in some cases are of national importance. Such is the cutting of the Mississippi levees which turned many square miles of valuable and productive territory into a waste of waters. An appropriation of $4,000,000, has been made by the legislature of Louisiana to rebuild and repair the levees, a work that should have been undertaken by the general government, if for nothing else, for the sake of securing uniformity in the results, but it is a work of a national character, as the river which the levees protect is a highway for a continent and these levees extend for over 180 miles. The levees are made of soil, clay, or turf, strengthened with cypress logs and vary from five to fifteen feet in hight and from ten to thirty feet in width or thickness.

A prominent engineer, Mr. G. W. R. Bayley, proposes an improved method of constructing the embankments which seems well calculated to withstand the ravages of time and wear. He says: The disastrous results consequent upon the construction of inadequate levees, simple embankments of earth, without support or protection from the ravages of crawfish or the action of the river waves, show conclusively that a different mode of building and maintaining them must be adopted. Newly constructed levees of earth, unsupported, and unprotected, cannot be depended upon, but it is claimed that with suitable support and protection they can be guaranteed against failure. A system of piling, with heavy cypress timber, sheet piling and revetment of three inch cypress planking properly constructed in front, or on the river side of all large and important levees, will protect and preserve them from the borings of crawfish, from leaks, from the action of river waves during storms, from being cut by evil disposed persons and from all other sources of danger.

This year's experience proves that a new or green levee of earth will not stand with a rear or land slope of two to one, or two feet horizontal to one foot perpendicular. With this slope, when saturated with water, the earth sloughs off, or slides down, taking a flatter slope and thereby diminishing the width at top. The front is washed down by the action of the river waves, and a crevasse is the result.

The plan I venture to propose is, to increase or extend the rear or land slope to not less than three to one, and to substitute for the very flat, or four to one, river side slope adopted by the Levee Commissioners—a work of piling, sheet-piling and inclined revetment of cypress timber and planking. This work to be made of piles, driven fifteen feet into the ground, in two rows, ten feet from center to center in the line of the levee, and distant from each other equal to the hight of the levee. Horizontal pieces to be bolted to the front row of piles above and below ground, a trench being dug about five feet deep for the latter, and sheet-piling driven to a depth of ten feet below the surface, or five feet below the bottom of the trench, in front. The front row of piles to be cut off five feet above the ground, and the rear row at the hight of the levee, which should be not less than five feet above the highest water line. Inclined timbers to be bolted to the heads of the front and rear rows of piles. Then horizontal pieces to be bolted, about five feet from centers, to these inclined timbers, and the whole covered with three-inch planking. The lower ends of the inclined planking to be fitted to the inner side of the sheet piling.

It may be objected that it will cost too much, but security and safety should be the true measure of economy. It is thought, however, that the saving in the amount of earthwork by substituting this kind of protection for the four to one river side slope would equal very nearly if not quite the cost of it. Such a work, if made of good cypress, would not need repairs for ten years.

Millions have been expended in the construction of inadequate levees, and untold millions have been lost by their failure. Nearly all of the new levees, particularly in upper Louisiana, have been swept away. Would not reliability and safety be a sufficient equivalent for a small increase in expenditure? The river accommodates itself quickly to every increase or diminution of its high water discharge. A decrease adds to the sand bars and contracts the sectional area by diminution of current; an increase washes them away and increases the section by an increase of current. With a greater velocity of current, and a larger sectional area, a greater quantity is discharged in a given time with the same, or even less surface slope.

We must make levees in such a manner and of such hight and strength as cannot break, and thus reclaim and protect the whole valley, or we must surrender the whole to destruction. No middle course is possible; it must be, in the very nature of things, either all levees or all outlets. Although the first effect of the building of levees of sufficient hight and strength, (protected in front,) from the river's mouth to Cairo, or in such a manner that they cannot give way, would be an increased rise, yet immediately afterwards the river channel would be accommodated to the increase, the sectional area would enlarge by the washing away of the sand bars—or a portion of them—and the greater quantity would be discharged in the same time by an accelerated current and a diminished slope—the river surface would be reduced.

WOODEN PAVEMENTS.

The city government having authorized the laying of Nassau street from Pine to Spruce with the Nicolson wooden pavement, and the Mayor having withheld his approval until he can hear objections, has brought the question again before the public.

The past experience of New York with wooden pavements has been unfortunate. Many years since a block on Broadway, between Chamber and Warren streets, was thus paved, and its even surface, freedom from creation of noise, etc., gave such general satisfaction that it was copied in other streets, and one block was put down, where the Nicolson pavement now is, in Nassau street between Wall and Pine. But after a considerable period of wear, some of the blocks began to decay, and this state once arrived at, almost all the rest of the blocks rolled out at once. In heavy rains also water collected under loose blocks, which floated, thus causing unsafe footing for which, and other reasons, wooden pavements were dismissed.

Those pavements were, however, of larger blocks of wood than those now used; were of octagonal form, and placed, on end, each one touching the other, upon a foundation bed of sand. There was no provision to exclude water, which settled between the blocks, and aided their decay. The construction and practical operation of the Nicolson pavement, both of which we described lately, are entirely different in these respects. A further test made on the 4th inst. by the Croton Board showed that not only is this pavement taken up and replaced with peculiar facility, but the sand beneath remains dry and the wood unassailed by decomposition and even unworn to any perceptible extent, by nine months of the severest usage to which pavements are liable.

Still, there is no sufficient reason to conclude that the Nicolson pavement is the *ne plus ultra* of human ingenuity and nature's resources. Before any more large paving jobs of any kind are decided on, we hope to see a capable commission appointed to examine and test the different methods, including several which are yet in the background—such as Stafford's and others—as well as to stimulate further invention to do its best, if not already done, for this important object.

AMERICAN STANDARD FOR BOLTS AND NUTS.

Several years ago we strenuously urged the establishment of a standard for the number of threads on different sizes of bolts, the object being to secure uniformity throughout the country, to the advantage of all who used machinery of any kind. The subject was also treated by the Franklin Institute, and a committee was appointed by that body who recommended a form of thread, the relative proportions of heads, nuts, and shanks, and the number of threads for different diameters. We believe their decisions could not be materially improved upon, and cordially recommend their standard for general adoption.

Mr. Edward Lyman, engineer and machinist, of New Haven, Conn, whose advertisement may be found in another column, has embodied the results of the committee's labors on a lithographed sheet, which gives the dimensions and proportions of nuts and bolts from one quarter of an inch diameter to three inches, drawn to full size and the measurements properly designated. A section of the form of thread adopted, much enlarged, is also given.

COPPERED IRON HULLS.—Although the French Government is liberally sustaining Mr. Bernabé's experiments, and has ordered one of its iron-clad vessels, *Le Belliqueux*, to be coppered by the plan of M. Roux, it is unknown, at least to the public, how the disintegration of the connected metals in sea water is to be obviated. It is a law of electricity, that where two metals in conductive proximity are both brought in contact with a fluid, that which is electro-negative to the other must be dissolved, with an energy proportionate to the activity of the fluid, and the difference between their electric states. It is not seen how the new experiments are to be exempted from the failure which has attended their predecessors, unless a ship's copper can be guaranteed against all flaws, accidents, and abrasions. A communication to the *Mechanics' Magazine* suggests enveloping iron hulls with planking, on light ribs, the interspaces being filled with some kind of asphaltic concrete, and the wooden skin sheathed with copper in the usual way.

BOND'S BOILER FEEDER.—We direct attention to an advertisement on another page of this apparatus, patents for which were secured through the Scientific American Patent Agency in this country and England. It has been fairly tested and has secured the unqualified commendations of practical men who have it in constant use. It is simple, cheap, and not liable to become deranged in operation. We think it worthy the attention of our engineers and users of steam power.

SAFETY BLASTING POWDER.—Tehleisen, a chemist of Wurtemberg, has patented a blasting powder which he calls kaloxylin, and which is not exploded by a blow, a shock or friction. The carbonaceous ingredient is cellulose prepared from sawdust of hard non-resinous woods, (nine parts) with three parts of charcoal, and forty-five parts nitrate of potash.

THE first gold discovered in the United States was found in Cabarrus county, N. C., in 1799.

[From our Foreign Correspondent.]

JOURNAL OF THE PARIS EXPOSITION.

PARIS, April 16th 1867

The exhibition is now rapidly approaching completion and it is difficult to see how it can be claimed that it has failed to realise the expectations that had been formed of it. Certainly there never before was brought together such a collection of machinery of all kinds, never were so many excellent pictures and fine pieces of statuary by living artists exhibited in a single enclosure, and to the spectator nothing could exceed the general elegance of the building and its contents. Large as it is, the main building alone would be entirely inadequate to contain all the articles exhibited, and probably fifty per cent is added to the collection by what is comprised in the annexes and subsidiary buildings which almost fill the grounds. These are very various in their character as we have in one place a chapel containing specimens of ecclesiastical art which, though by reason of its surroundings appearing small, is really larger than many a village church, in another, two buildings devoted to paintings which alone would form a fine collection, and in another a model barn and barnyard in which four or five cows are comfortably stalled besides a good number of sheep, hens etc. Another building contains Armstrong's and Whitworth's display of guns, besides some specimens of armor plate, one piece 12 inches in thickness; others again are filled with machinery of various descriptions such as locomotives, lathes and cotton gins for which space could not be found in the grand gallery.

AUSTRIAN LOCOMOTIVES.

Perhaps the most remarkable part of the exhibition is the collection of locomotives that have been brought together. The design of some of these is of the most extraordinary nature and this is especially true of the good engines from France and Austria. Begining in the Austrian department we find a pair of engines by Sigl, of Vienna, one a goods, and the other a passenger engine. The foreman has eight coupled wheels 4 feet in diameter, and outside horizontal cylinders 20 inches diameter by 25 inches stroke. The piston rods are prolonged so as to pass through the forward cylinder head so as to sustain the weight of the pistons. The wheels have outside bearings of rather narrow width. The framing is ormed of two plates about ¾ inch thick placed about 1¼ inches apart and filled in with wood, the depth being more than two feet, but with much of the central part cut away. The cylinders which project considerably from the frame are bolted to the top and bottom portions of the latter, the steamchests being placed above the cylinders. It hardly seems possible that this fastening can be sufficiently strong for cylinders of this size. The valve gear is placed outside, the eccentrics being carried by an overhung crank, and is of the straight link kind. Judging merely by eyesight measurement it is not proportioned so as to give a correct distribution of the steam. The connecting rod takes hold of the last wheel but one, and the three after wheels are connected by compensating levers, the forward one being independent. As this is situated at about the center of the length of the slides and therefore has the entire overhanging weight of the cylinders, it would appear that the weight on this axle must be excessive. The after axle also has the whole of the firebox overhanging it. The wheel base is 12 feet 9½ inches, which is not too long, a slight amount of end play being allowed in the forward axle. The engine is intended for wood burning and has an American chimney. The top of the boiler is slightly raised over the firebox.

The passenger engine by the same maker, has four coupled wheels and a single pair of leading wheels of a less diameter. The cylinders are placed outside, and the steam chests pass through the frames (which are quite similar to those of the goods engine) the valve gear being of the usual form of shifting link motion. There is a tolerably free access to the valves but the cylinder fastening as near as can be judged, is no better than in the other engine. For an exhibition where the prime object is to show the details of mechanical construction the example of one exhibitor is to be commended, who has sent an engine entirely without lagging. Many points about the engines we have been noticing are obscured by unsightly sheet iron casings. The drivings are 5 feet 3 inches in diameter and the wheel base 13 feet 1 inch the three axles being placed at nearly equal intervals of 6 feet 6 inches and 6 feet 7 inches. The cylinders and firebox overhang the extreme axles in this case also. The springs over the driving axle boxes are connected by equalizing levers. The boiler of this engine is made flush, and both engines have cabs, but are entirely devoid of beauty in any respect, and are just such engines as one would always expect to find dirty and neglected. They are fitted with a form of injector patented in Germany by Schan, which is of the fixed nozzle class.

A NOTED LONDON LOCOMOTIVE.

Close to these engines stands the "Steyerdorf," an engine exhibited in 1862 at London and constructed for working the heavy gradients on the South Austrian Railway. It has ten coupled wheels driven by a single pair of outside cylinders, but the peculiar feature about it is that the two after pairs of wheels are arranged so as to swivel on a fixed center in order to avoid the evils of a long wheel base. To permit the use of coupling rods with this arrangement an intermediate shaft is placed directly above the axle of the forward pair of the four swivelling wheels, in bearings in the end of a stout link or coupling rod from the axle below it and it thus necessarily maintains a constant distance from that axle. Another link with spherical bearings connects the bearing of the intermediate shaft with the bearing of the after pair of fixed wheels and thus the distance between these two is maintained constant also. The intermediate shaft carries a crank at its extremities and coupling rods extend from this to a crank on the axle below it, and in an inclined direction to the crank of the after pair of fixed axles. The connection between the bogie frame and that of the rest of the engine is made by means of a stout pin connecting two stiff cross girders of wrought iron running horizontally between the opposite sides of the engine. The cylinders are a little over 18 inches diameter, by nearly 25 inch stroke and the steam chests are inside between the frames. The driving wheels are fitted with steam brakes which consist of a pair of cylinders placed vertically underneath the barrel of the boiler the piston rods working downward and being connected by suitable levers to a shaft placed above the wheels, an arm on which carries a wooden brake block pressing on the top of the wheel. The diameter of the wheels is but 3 feet 3½ and the coupling rods therefore come very near the ground. The engine weighs in working trim 4½ tuns and has a tender for carrying water only, the upper part forming an ordinary freight car.

LOCK NUTS NOT UNDERSTOOD.

I have noticed one singular fact in walking through the various departments which I think deserves mention. It is that apparently none of the European exhibitors understand the action of lock nuts and therefore how they should be arranged. In every case where any difference is made in the thickness of the two nuts the thinner one is placed outside. Now if we suppose two nuts to be jammed against each other we shall see that they will each be pressed equally against the sides of the thread in opposite directions. When any external strain therefore comes upon them the inner one will be more or less relieved from pressure against the thread until, if the force be sufficient, it becomes merely a distance piece between the body bearing against it and the outer nut. Of course in such a case it does not work, and indeed as long as it bears against the side of the thread against which it was at first forced, it only increases the strain on the outer nut transmitted from the pressing body. Could any thing be more meaningless therefore than to use a thin nut for the outer one and a stout one beneath it? To my surprise almost the only engine I have observed that has these nuts rationally arranged is Mr. Corliss', though it is certainly surprising that so simple a matter should not be better understood. In the American department generally, however, both nuts are made of the same size probably to avoid the labor of turning down from the usual size, but this is certainly much more reasonable than to turn down a nut, then give it all the work to do and use a thick one to keep it tight.

ENGLISH OPINION OF THE AMERICAN LOCOMOTIVE.

Our American locomotive, despite its gaudy ornamentation, attracts a good deal of attention, and much commendation. It may not be improper for me to mention that a day or two since Mr. Beyer of the firm of Beyer & Peacock, generally considered the best locomotive builders in England, after examining it carefully and pointing out many of its defects to the gentleman in charge of it, concluded his remarks by saying to a friend "Well there are a good many bad things about that engine, but it is undoubtedly the best engine in the Exhibition." Those who know Mr. Beyer will not accuse him of being over fond of commending foreign machinery.

SLADE.

A FLOURING MILL AND BAKERY IN FULL OPERATION.

The London *Engineer* gives the following:—

"The next building is a flouring mill and machine bakery combined, and complete in all their parts. It is a very tasteful wooden edifice, two stories high, besides some rooms in the foundation; it is about 100ft. long by 40ft. wide, and has a verandah, Swiss fashion, around the upper story. On the ground floor of the building are a range of ovens of various makes, and for different fuels, including gas. Opposite them are sundry forms of machine kneading-troughs, besides some for ordinary hand work. At the north end on this floor are two pair of millstones, and another pair close to them which have a sifting arrangement within their case by which the bran is taken off and one quality of fairly white flour discharged without further manipulation. A horizontal Hugon gas engine of three horse-power gives motion to the dough kneading machinery. There are two very handsome marble counters outside the principal door, at which bread is sold as well as within the building, which is generally crowded to excess in the afternoons. 22,000 penny rolls alone were sold on Easter Monday.

MARINE LIFE-SAVING INVENTIONS.—The labors of the Commissioners are rapidly approaching completion. The public examination of the multitudinous contrivances for the better protection of human life and property on shipboard, has been closed and now the Board is busily engaged in secret session in comparing the merits of these several devices, as indicated by the results obtained in their practical operations. All inventors who have had dealings with these gentlemen, speak highly of their uniform courtesy and attention to the oftentimes labored and protracted explanations of the enthusiastic patentees. The official report, we are informed, will be made public soon after its presentation.

IRON PERMANENT WAY.—To the German experiments described in a recent number of the SCIENTIFIC AMERICAN, England adds a remarkably simple method in use for twelve months past under a short piece of track on the Southwestern Railway, near Vauxhall. Upon the under side of the rail is bolted a series of bed plates, of ¼inch iron, two feet long, of nearly the same width, and alternating with blank spaces of about equal length. The plates hollow slightly beneath, and rest on the gravel like a saddle. The success of the experiment is said to be perfect, in regard to evenness, durability and elasticity, and the whole expense of the structure and track per mile, compares with that of a track with wooden sleepers (in England) is put at £580 to £614.

ISSUED FROM THE U. S. PATENT OFFICE

FOR THE WEEK ENDING MAY 7, 1867.

Reported Officially for the Scientific American

PATENTS ARE GRANTED FOR SEVENTEEN YEARS, the following being a schedule of fees:—

On filing each Caveat	$10
On filing each application for a Patent, except for a design	$15
On issuing each original Patent	$20
On appeal to Commissioner of Patents	$20
On application for Reissue	$30
On application for Extension of Patent	$50
On granting the Extension	$50
On filing a Disclaimer	$10
On filing application for Design (three and a half years)	$10
On filing application for Design (seven years)	$15
On filing application for Design (fourteen years)	$30

In addition to which there are some small revenue-stamp taxes. Residents of Canada and Nova Scotia pay $500 on application.

☞ Pamphlets containing the Patent Laws and full particulars of the mode of applying for Letters Patent, specifying size of model required, and much other information useful to inventors, may be had gratis by addressing MUNN & Co., Publishers of the SCIENTIFIC AMERICAN, New York.

64,397.—COMPOUND STRUCTURE OF RUBBER AND FIBER FOR BELTS AND OTHER PURPOSES.—William A. Adams, Franklin, Mass.

I claim a compound structure of vulcanized rubber and fiber in which the disposition of fiber is substantially that specified.

64,398.—APPARATUS FOR DRYING AND SEASONING LUMBER BY SUPER-HEATED STEAM.—C. F. Allen, and Luther W. Campbell, assignors to themselves and A. T. Hall and A. J. Ambler.

First, We claim a superheating steam generator which is constructed and supplied with water and arranged within a drying kiln, substantially as described and for the purposes explained.

Second, In a drying kiln, we claim the arrangement of a divisional pan, F, within the generator, E, for the purpose of protecting the latter from contact with water, substantially as described.

Third, The floors, A1, A2, with space between them, arranged at the top of the kiln, in combination with the ventiducts, b, leading into the kiln from beneath the drawing apartment, substantially as described.

Fourth, In combination with the escape valve, g, of the superheating generator we claim the balance valve, s, communicating with the open air, substantially as described.

Fifth, The elevated water tank, G, pipe, e, pan, F, in combination with a superheating generator which is adapted for drying purposes, substantially as described.

Sixth, We claim a provision for conducting off the moisture from a point which is below the desiccating chamber or kiln in which superheated steam is employed for drying purposes, substantially as described.

64,399.—AWNING.—George H. Bancroft, Philadelphia, Pa.

I claim the ratchet wheel, D, detents, a a', cords, b b' metallic rods, c, and the metallic hooks, f f f, etc., when combined and arranged, substantially as and for the purpose herein specified and described.

64,400.—PNEUMATIC TUBE.—A. Ely Beach, Stratford, Conn.

I claim the employment in combination with pneumatic walls or tubes of automatic valves operating substantially as herein shown and described.

64,401.—PNEUMATIC CAR TRUCK.—A. Ely Beach, Stratford, Conn.

I claim the employment of pneumatic trucks made substantially as herein shown and described.

64,402.—PNEUMATIC RAILWAY.—A. Ely Beach, Stratford, Conn.

I claim the employment of the within described device in combination with pneumatic tubes, substantially as set forth.

64,403.—HORSE HAY FORK.—D. S. Blue, Fremont, Ohio.

I claim the shaft, A, slide, B, slots, b d, and arms, E F, in combination with the lever, C, wrist, f, and catch, D, arranged and operating as and for the purpose substantially as set forth.

64,404.—SEWING MACHINE TUCK-CREASER.—Edward Bostock, Albany, N. Y.

First, I claim the tuck creaser or folder for use with or without a sewing machine made and operated as specified.

Second, I also claim in combination the gage plate, N, constructed as described, the plate, A, and the creasing wheel when both plates are adjustable relatively to each other, and also relatively to the needle and feeding device of the machine, by means of a single thumb screw.

Third, I also claim in combination with the plate, A, which carries the creasing devices the gage plate, N, having a downward projection, W, on the same for the purpose of sliding or adjusting it along the plate, A, in such a manner as to secure a parallelism of the straight edge with the line of creasing and stitching.

Fourth, I also claim the socket or bridge, L, fixed firmly upon the plate, A, for embracing and keeping in true position, the wheel supporting bar, D H, and also for the reception of a thumb screw, M, for adjusting the vertical pressure of the wheel or creaser.

Fifth, I also claim constructing the arm, D, with a right angled projection which supports the wheel, as and for the purpose specified.

Sixth, I also claim the combination of the right angled projection on the wheel carrying arm, D, with the right angled projection on plate, A, when the same are constructed and arranged to operate as described.

64,405.—REFRIGERATOR.—James Bragdon, Boston, Mass.

I claim in a refrigerator so constructed as to have between its food chamber and the casing thereof an air space, the air passages, f l and k, so located and arranged in conjunction with the deflectors, h and i, and the falling water from the melting ice to establish a current of pure cool air and through the food chamber, substantially as described.

64,406.—MEANS OF ATTACHING HANDLES TO WHITE WASH BRUSHES.—William B. Burtnett, New York City.

First, I claim the construction of the ferrule, D, with an eye, b, and with a series of grooves around said eye in combination with a staple, B, and a set screw, G, substantially in the manner and for the purpose set forth.

Second, The combination of two or more screw-tapped lugs, g g, with the open grooves, e f, on both sides of the ferrule and with the eye, b, substantially as and for the purpose set forth.

64,407.—PIANO FORTE.—Pierre Eugene Chollet, New York City.

I claim the combination with the levers, E and H, the latter of which is provided with the hooks or their equivalents, I claim the use or employment of the notched head, screw, and pointer for the purpose set forth.

64,408.—FORGING MACHINE.—L. L. Crane (assignor to himself and Leavett Crane & Co), Cleveland, Ohio.

I claim the dies, J K, constructed as described in combination with the anvil and trip hammer, B D, all arranged and operating as set forth.

64,409.—CAR BRAKE.—S. F. Dimock, Spencer, Ohio.

I claim, First, The adjustable link, E, rollers, H and I, in combination with the rod, G, shaft, T, spool, V, arranged and operating substantially as and for the purpose set forth.

Second, The adjustable link, E, rollers H and I, in combination with the shafts, J W, and gearing P and L, arranged and operating as and for the purpose substantially set forth.

Third, The shafts, J W gearing P and L, in combination with the rollers, Q, adjustable stay, N, wheel, C arranged as and for the purpose substantially as specified.

64,410.—DEVICE FOR FORMING LETTERS ON TYPE BLOCKS. Daniel A Draper, Cambridge, Mass.

I claim the combination of the within described devices for producing letters, figures, etc., upon the edges of the type blocks for hand stamps and other purposes, substantially as set forth.

64,411.—MANUFACTURE OF ARTIFICIAL TEETH.—William E. Dunn, Delaware, Ohio. Antedated Feb. 2, 1867.

I claim a denture constructed by the application of biscuited and unglazed teeth to the plastic body or base while in the mold, substantially as described.

64,413.—WASHING MACHINE.—Francis Elder, Chester, South Carolina.

I claim the combined arrangement of the ledges, h h i i, cover, H, rubber H, movable journal caps, l l, and dasher board, g, both above and below the rear or upper edge of the rubber, B, as specified.

64,413.—WAGON BRAKE.—S. J. Farr, Medina, Ohio.

I claim the arrangement of the slotted coupling pole, D, bar, E, brake arrangement, e e G G, lever, J, and staff, I, substantially as described.

64,414.—STEAM BLOWER.—M. Foreman and J. R. Mathewson, Philadelphia, Pa.

We claim a steam pipe, E, in combination with two or more pipes, A A', of different diameters, the whole being arranged and operating substantially as described.

64,415.—STOVE PIPE DAMPER.— William T. Gray, Galesburg, Ill.

I claim the combination and arrangement of the fan wheel, with the circular plate and ring, the parts being arranged and operating in the manner and for the purpose specified.

64,416.—APPARATUS FOR CRUSHING AND AMALGAMATING ORES.—James Hart, Melbourne, Victoria.

I claim the combined arrangement of the cylinders, L M P, constructed and working substantially as herein described.

64,417.—FENCE POST PEDESTAL.—G. W. Hatch, Garretsville, Ohio.

I claim the construction of a metallic pedestal, A, provided with ventilating openings, G, in combination with the post, E, for the purpose and in the manner, substantially as described.

64,418.—VELOCIPEDES.—F. G. Hoeppner (assignor to himself and Charles Burchardt), New York City.

I claim the compound lever, G g h, in combination with the body, A, of the toy and with the ratchet wheel and pawls or their equivalents mounted on the axle, C, substantially as and for the purpose described.

64,419.— MODE OF COATING WOOD WITH RUBBER AND GUTTA-PERCHA.—K. W. Holmes, McGranville, N. Y. and Andrew Albright, Dryden, N. Y.

We claim the coating and lining of wood with rubber, gutta-percha or prepared gum, substantially as set forth.

64,420.— MACHINE FOR CUTTING SCREW TAPS.— William and James Holroyd, Waterford, N. Y.

We claim, First, The vertically adjustable tool rest, D, vibrating plate, D', and sliding support, E, in combination with rotary centering points, b b', substantially and for the purposes described.

Second, The application of the rotary pattern, P, to an adjustable bar, H, which is applied to a treadle, K, substantially as and for the purposes described.

64,421.—BITTERS.—Jacob D. Holtzermann, Piqua, Ohio.

I claim the compounding or combination of the above named ingredients in proportions above as set forth.

64,422.—MODE OF DEFLECTING THE BOTTOMS OF VESSELS MADE OF SHEET METAL.—L. T. Hulbert, Painesville, Ohio.

I claim the use of the independent rotary head, fig. 1 constructed and operating in combination with the former fig. 2, in the manner substantially as specified and for the purpose set forth.

64,423.—HOLLOW AUGER.—Morris Isbell, New Haven, Conn.

I claim the divided head, B, in combination with the springs, C C, the land, D, and the adjusting screw, E, all constructed and arranged to operate substantially in the manner described.

64,424.—TUBE FOR STEAM GENERATORS.—C. H. James (assignor to himself and Frank Millward), Cincinnati, Ohio.

I claim the stationary or rigid confined tube, K, provided with one or more enclosed ducts or passages, L, communicating the outer or fire tube, I, with the water space on the crown sheet of the boiler, the outer tube, I, extending and discharging its contents above the water line or above the passage, L, communicating with the inside tube, K.

64,425.— MANUFACTURE OF IRON.— Jacob Jameson, Philadelphia, Pa.

I claim, First, The production of wrought iron direct from the ore by the process, substantially as described.

Second, In combination with the oven, A, constructed as described, I claim the double furnace, I, as set forth.

Third, I claim the combination of the oven, A, furnace, I, and gas chamber, F, for the treatment of ores when arranged for joint operation, substantially as described.

64,426.—KEY HOLE GUARD FOR DOOR LOCKS.— William Johnson 2nd, Haverhill, Mass.

First, I claim the combination as well as the arrangement of the key hole guard, F, and its operation mechanism, viz: the spring, G, the stud, I, and the cam, K, with the bolt and the lock case provided with a key hole as set forth, such guard being for the purpose as specified.

Second, I also claim the combination as well as the arrangement of the stud, L, and the projection, d, with the lever guard, F, applied to the bolt, B, and to operate therewith and with respect to the key hole of the lock, substantially in manner as hereinbefore described.

Third, I also claim the combination as well as the arrangement of the stud, L, and the catch, e, with the lever guard, E, applied to the bolt, B, and to operate therewith and with respect to the key hole of the block, substantially in manner as hereinbefore explained.

Fourth, I also claim the combination as well as the arrangement of the spring latch, M, its catch slot and the projection, N, or their mechanical equivalent, with the lock case and with the lever guard, F, applied to the said case, and the main bolt, substantially in manner and so as to operate with respect to the key hole, essentially as and for the purpose hereinbefore set forth.

64,427.—FAUCET.—T. J. Jones, Summit, N. J., and T. L. Webster, Brooklyn, N. Y.

First, We claim holding the plug of a faucet or stop cock to its seat by means of a spring which is inserted into or through a recess made transversely through said plug, substantially as described.

Second, The construction of the V-shaped spring, C, with a centering notch in it, for the purpose specified.

64,428.—JOINT FOR CHIMNEYS.—Marvin H. Kelsey, Red Bank, N. J.

I claim the metallic collar, A, for chimneys having the gutters, a, upon each side, substantially as described for the purpose specified.

64,429.—CULTIVATOR.—Abraham B. King, Camden, Ohio.

First, I claim the arrangement of two outer cultivators, F A S J F''' A''' S''' J', and two inner and smaller ones, F' A' S' K F'' A'' S'' K', so coupled together by the pieces, G M D, and their described accessories as to be held rigid, or to swing from side to side, or to be separated into two distinct double-share cultivators, in the manner described.

Second, The arrangement on the inner or land side, and in rear of a cultivator share of one or more independently-attached laterally-projecting blades or cutters, T, substantially as and for the purpose stated.

64,430.—GRATE FOR STOVES.—Henry G. Leonard, Taunton, Mass.

I claim, in combination with a tipping and horizontally vibrating grate, the lever, i, into a slot in which a pin or projection from the grate works when the lever is applied to the cross shaft or axis, c, and operate the grate, substantially as set forth.

64,431.—APPARATUS FOR THE PREPARATION AND ADMINISTRATION OF NITROUS OXIDE GAS.—A. M. Leslie, St. Louis, Mo. Antedated April 23, 1867.

First, I claim the combination and arrangement of the tubes, b, in the cap f the jar, and the tubes, D and d, substantially as herein described and set orth.

Second, I claim the employment of the india rubber tubes, D, for connecting the different jars together and these to the generator and receiver, and for conducting the gas down through the water.

Third, I claim the portable apparatus, A B, when constructed and employed, substantially as herein described and set forth.

Fourth, I claim the inhaler, E, when constructed with the valves, e and e'.

64,432.—BABY TENDER.—Landon Limerick, Louisville, Ky.

First, I claim the arrangement of chair, E H I, adjustable forward or backward, along a spring, C, for the object explained.

Second, The combination of base, A, spring, C, sliding chair, F G H I, and auxiliary spring, E.

Third, The chair, F G H I, with the brackets, K K1 L, knobs, N O, adapted for a sitting or any recumbent position and supported upon a spring or yielding rest, substantially as set forth.

64,433.—FOUNDATION FOR ROOFS.—Robert O. Lowrey, Saratoga Springs, N. Y.

I claim a plastic foundation for roofing cement, prepared and applied substantially as herein described.

64,434.—SPRINGS FOR VEHICLES. — David Dick Matteson, Harmonsburgh, Pa.

I claim a spring for carriages or buggies constructed of one piece of steel bent or formed in the manner described, constructed in the aforesaid combination and for the purposes set forth.

64,435.—GOVERNOR.—Thomas B. McConaughey, Newark, Del.

First, I claim the governor arms, a a, in combination with the main piece, B, and loose collar, d, as and for the purpose set forth.

Second, The springs, c c, in combination with governor arms, a a, substantially as and for the purpose specified.

64,436.—OIL CAN.—John S. McIntire, Chicago, Ill.

First, I claim the narrow neck, B, arranged relatively to the can, A, and side spout, D, substantially as and for the purposes specified.

Second, The arrangement and combination of the narrow neck, B, the funnel, C, side spout, D, and vent tube, F, with the can, A, substantially as set forth.

64,437.—HOSE COUPLING.—Barney Mee, Troy, N. Y.

First, I claim a packing ring applied in a recess in the male part of a coupling in combination with a female member of the same coupling, the combination being substantially as specified.

Second, I claim, in combination with a packing ring, applied and acting as specified, and the male and female parts of a coupling, a bayonet fastening, or the mechanical equivalent, or substitute therefor, for holding the parts in place until pressure is applied to the packing ring, the combination being substantially such as set forth.

Third, I claim an annular recess, in combination with the male part of the coupling, and with holes leading into it from the hollow of the coupling, forming a seat and an apparatus for applying pressure to a packing ring, the combination being as described.

Fourth, I claim an annular recess, formed in the periphery of the male part of a coupling, provided with holes leading into it from the hollow of the coupling, in combination with the female part of a coupling, whereby a packing ring may be applied so as to pack a coupling joint, the combination being as described.

64,438.—HAND SPINNING MACHINE.—N. M. Mendenhall and J. Judd, Terre Haute, Ind.

First, We claim the lever, p, notched bar, q, reversing pinion, O, gear wheels, l and l', and pinions, m and n, pulley, s, and cord, s', in combination with the carriage, c, as and for the purpose specified and set forth.

Second, The vibrating bar, y', spring, t, cord, y'', trip bar, y''', link, 9, lever, 10, cam bar, 5, cam, 6, arranged and operated substantially as above described and for the purpose specified.

64,439.—METHOD OF MOVING BUILDINGS.—John H. Moore, Binghamton, N. Y.

I claim the construction of the frame, A, and the roller, B, in combination with the parallel bars or scrapers, G, the lever and lock, H, the hooks, P, the bolster, C, as represented and described.

64,440.—STAIR ROD.—William A. Morse, Philadelphia, Pa.

I claim, First, A stair rod made of paper, paper pulp, felt, cloth, leather, or other equivalent fibrous material, lacquered, gilded, or otherwise ornamented to resemble highly finished brass, substantially as described and for the purpose specified.

Second, I claim the use of paper, paper pulp, felt cloth, or leather, either separate or in combination, in the manufacture of stair rods, substantially as as specified and for the purpose set forth.

Third, I claim the use of either of the above-named materials in combination with wood or metal, substantially as specified and for the purpose set forth.

64,441.—WINDOW.—John B. Mulvey, Visalia, Ky.

First, I claim the combination of the solid window frame, G G', spring pulley style, E, and locking device, H I, substantially as shown and set forth.

Second, The locking device, composed of the square bolt, H, removable key, I I, and cleat, J, as set forth.

Third, Attaching the cords of the weight to the sash by means of the grooves, k k, the recesses, l l' m m', the pins, n n', and knots, o o', substantially as set forth.

64,442.—SHOVEL.—D. B. Nelson, Elmira, N. Y.

I claim constructing shovel blades with teeth, substantially as as and for the purpose set forth.

64,443.—COMPOSITION FOR PAINTING AND VARNISHING.—Samuel Page, Chelsea, Mass.

I claim treating the light distillate by additional substantially as and for the purpose described.

64,444.—ATTACHING BITS IN BRACES.—L. J. Parsons (assignor to himself and Henry Reynolds), New Haven, Ct.

I claim the combination of the plate, a, with the socket, B, and sleeve, C, constructed and arranged so as to operate substantially as herein set forth.

64,445.—WASHING MACHINE.—Marvin Pierce, Buffalo, Wis.

I claim the combination of the rotary cylindrical rubber, E, sweep, C, slotted uprights, B B, and washboard, A, the latter having the opening, a, and soap shelf, p, and all being constructed and arranged as herein described and represented.

64,446.—FIREPLACE.—Albert J. Redway, Cincinnati, Ohio.

First, I claim surmounting the fire chamber of a grate or stove with the arched crown, C, which extends from the front to the back of the fire chamber, and is provided with the side flues, D D', all arranged and operating in the manner herein described and set forth.

Second, In combination with the crown, C, and side flues, D D', I also claim the flue strips, G G', and abutments, H H, for the purpose specified.

64,447.—APPARATUS FOR ROLLING WRENCH BARS.—T. C. Rice (assignor to Thomas H. Dodge and T. W. Wellington), Worcester, Mass.

First, We claim the herein described combination of machinery for rolling wrench bars and other similar articles, organized substantially as herein shown and described for operation as set forth.

Second, The combination with the tongued segment roll, H, and grooved segment roll, I, of the stationary stop, f, and table, L, all constructed and arranged substantially as and for the purposes set forth.

Third, The combination of the notched segment roll, J, and flanged segment roll, K, constructed arm arranged for operation as described.

Fourth, The combination with the notched segment roll, J, and flanged segment roll, K, of the table, 3, and stationary stop, h, substantially as and for the purposes set forth.

Fifth, The combination with the notched segment roll, M, and flanged segment roll, N, of table, 4, and adjustable stop, s, substantially as and for the purpose set forth.

Sixth, The combination with the tongued segment roll, Q, and the grooved segment roll, R, having the flanges, x x, cut or inclined as shown at c', of the table, 6, and adjustable stop, as and for the purposes stated.

64,448.—HORSE COLLAR.—Daniel T. Robinson, Boston, Mass.

I claim, in the manufacture of horse collars, forming the roll of strips or layers of raw hide, arranged upon the collar, and secured together in the manner and for the purposes substantially as herein set forth.

64,449.—MANUFACTURE OF PAPER PULP.—C. A. Rose, Columbus, Ga.

I claim the combination of pine leaves and cotton stalks, either with or without the addition of oak leaves and pine cones, as a material for making paper pulp.

64,450.—TRANSMITTING MOTION. — Warren Rowell, New York City.

I claim the combination of the cranks, D D' D'', and arms or rods, E E' E'', or other suitable connection, so arranged relatively with each other that when rotary motion is imparted to the crank, D, it will be transmissible to the cranks, D' D'', and the shafts connected thereto, as herein described.

64,451. — TRANSMITTING MOTION. — Warren Rowell, New York City.

I claim the hereinbefore described means for transmitting a continuous coincident rotary motion.

64,452.—BEER COOLER.—Philip Schweikhart, Buffalo, N. Y., assignor to Daniel Schweikhart, Eden, N. Y.

I claim, First, A beer cooler having an ice box, B, a chamber, C, containing the liquid, and an air flue, D, and fan blower, E, or equivalent, constructed, arranged, and operating substantially as herein described.

Second, Cooling beer or other liquids by dividing the same into a large number of fine streams, and forcing an ascending current of cold air through the descending liquid, in the manner and for the purpose substantially as herein described.

Third, The perforated plate or troughs, F, having flanges, f1 f2, arranged in the manner substantially as herein described.

Fourth, The sleeves, G G1, in combination with the chamber, C, for the purpose and substantially as described.

64,453.—RAILWAY CHAIR.—Thaddeus Selleck, Greenwich, Ct.

I claim, in combination with the rails, A A, the flanged plate, C, extending the distance of three or more intervals of the ties, the clamp, D, extending across the middle interval and embracing the point of junction of the rails, and the end clamps, E E, all arranged substantially as herein described and represented.

64,454.—TOOLS FOR CUTTING OFF BOILER TUBES.—William P. Slensby, Chicago, Ill.

I claim, First, The combination and arrangement of the revolving head block, B, the adjustable cutter holder, D, and the slotted collar, F, as and for the purposes set forth and shown.

Second, I claim, in combination with the above, the shaft, A, and ratchet handle, C, operating as specified and for the purposes described.

64,455.—TOOTH BRUSH.—Thomas H. Spencer, Providence, R. I. Antedated April 23, 1867.

I claim the tooth brush having a detachable handle and a dentifrice container therein, substantially as described.

64,456.—PROOF METER AND REGISTER FOR ALCOHOLIC SPIRITS AND OTHER LIQUIDS.—William Mont Storm, New York City.

I claim, First, The float, E, acting as a hydrometer, and carrying a pencil or pencils, or any equivalent, in combination with the drum, G, covered with paper or some equivalent, rotating in contact with such pencil or pencils, or their equivalents, so that they shall describe a line denoting the varying specific gravity of the liquor flowing through the instrument.

Second, I claim the diagram, Figs. 3 and 8, in combination with my instrument, having the hydrometer scale in horizontal lines upon it, and vertical lines to denote gallons, etc., as explained.

Third, I claim having the pencils, independently of their rise and fall with the hydrometer or float, E, acted upon by changes of temperature, substantially in the manner and for the purpose described.

Fourth, I claim the use of two pencils, acting in the manner and for the purpose explained.

Fifth, I claim the use of the overflowing well, A, for the purpose described.

Sixth, I claim the application of the spring, r, or any equivalent device, for the purpose set forth.

Finally, I claim my instrument as a whole, its parts being constructed and operating together, substantially in the manner and for the purpose explained.

64,457.—LIQUID METER.—William Mont Storm, New York City.

I claim, First, The arrangement of the valve, i, rod, j, and lever, l, operating in conjunction with the sleeve, z, and piston rod, f, as and for the purpose described.

Second, I claim regulating a liquid meter, constructed substantially as described by means of the adjustable pistons, f f, as and for the purpose explained.

Third, I claim the glass cylinder, a, embracing a piston or pistons, moving on a central rod, and supported by a perforated exterior case, as and for the purpose specified.

64,458.—AMALGAMATOR.—Walter L. Strong, San Francisco, Cal., assignor to himself, G. W. Strong, and J. F. Taylor.

I claim, First, The shoes, c c and g g, in combination with the attaching joints, d and h, and the arms, D and G, substantially as and for the purpose described.

Second, The geared wheels, L m m, and the rim, n, in combination with the shaft, F, and muller, G g, as described.

Third, The wrench, O, with the shaft, P, operating upon the wheels, m m, rim, n, and shaft, F, substantially as and for the purpose described.

64,459.—HAY LOADER.—Luman D. Taylor, Granville Center, Pa.

I claim the arrangement in the pivoted and adjustable frame, D, of the belt, G, and auxiliary delivery belt, J, substantially as described and represented

64,460.—CHURN DASHER.—Johnson Thomas, Huntingdon, Pa.

I claim the adjustable dasher and butter gatherer, H and G, the lower perforated circular dasher, B, the adjusting rod, L, the atmospheric tubes, D, and their ball valves, E, at top, all in combination, when constructed, arranged, and operated as herein described, and for the purposes set forth.

64,461.—NOSE JEWEL FOR SWINE.—M. G. Tousley and F. E. Marcellus, Fulton, Ill.

We claim the arrangement and construction of the device, when constructed, arranged, and operating as and for the purpose above set forth.

64,462.—HORSE HAY FORK.—Maynard J. Turck, Schodack, N. Y.

I claim the arrangement and combination of the jointed cross bar, A A, fines, F F, cross bar, B, trip cord, t, and pulley, P, substantially as and for the purposes herein set forth.

64,463.—CHURN.—Marquis D. Wallace, White Creek, N. Y.

I claim the combination of the frame, B b, and adjustable telescope shaft, I, constructed and operating as described.

64,464.—PLOW HANDLE.—George Watt, Richmond, Va.

I claim the curved metallic socket, A, constructed as described, and employed for the purpose specified.

64,465.—FIRE PLACE.—Marshall D. Wellman, Pittsburg, Pa.

First, I claim the combination of the shallow recess, g, in the back wall, or back wall and side walls of a fire place, with the opening, i, and flue, k, substantially as and for the purposes hereinbefore set forth.

Second, Making the rear part of a fire basket with grate bars, e e, parallel to each other, and closer together than the bars, d, that compose the front part of such fire basket, substantially as and for the purpose hereinbefore described.

Third, The combination of the dust holes, m m, furnished with slides, n n, the air passage, l, and flues, k, for the purpose hereinbefore described.

Fourth, The use of the tapering grate bars for the purpose of diminishing gradually the amount of air admitted to the fire, as the space between the bars.

Fifth, Perforating the tapering grate bars with air holes, for the purposes hereinbefore described.

64,466.—MACHINE FOR FOLDING CLOTH.—Walter Wheeler, Jr. (assignor to himself, Pardon Jenks, and E. O. Potter), North Providence, R. I.

First, I claim an apparatus for folding cloth, which employs two sets of folding clamps, or the equivalent thereof, acting in alternation, to hold the cloth suspended by the upper folds already made, while a new fold is being laid, and operating for the purpose substantially as described.

Second, The combination in a machine for folding cloth of the following: first, delivering rolls or equivalent means for supplying cloth to be folded; second, an inclined conductor, F, and transverse folding bar, G', and two sets of clamps working in alternation, all substantially as herein described.

64,467.—MODE OF DISINFECTING COFFINS.—Samuel H. Young, St. Louis, Mo.

First, I claim deodorising and disinfecting corpses by enclosing the same in a receptacle wherein chlorine, or other equivalent, or disinfecting gas is continuously generated and liberated, substantially in the manner and for the purposes herein set forth.

Second, The combination of a disinfecting and deodorising compound with the interior of a coffin, in such a manner as that there shall be a gradual and constant generation and liberation of a disinfecting and deodorising vapor in the coffin, substantially in the manner and for the purpose herein set forth.

64,468.—ATTACHING CARRIAGE THILLS.—H. S. Allen, Granger, Ohio.

I claim the hook or head, C, provided with a slot, a, in combination with the pin, D, cheeks or jaws, E, and back piece, F, arranged as and for the purpose set forth.

64,469.—CULTIVATOR.—John H. Allison, Eureka, Ill.

First, I claim the harrows, I I, connected together, and to the front part of the frame, A, as shown, in combination with the foot lever, F, all arranged to operate in the manner substantially as and for the purposes set forth.

Second, I claim the adjustable driver's seat, D, in combination with the harrows and foot lever, substantially as and for the purpose specified.

64,470.—ORGAN PIPE.—E. B. Andrews, Osborn Hollow, N. Y.

I claim an organ pipe, having its throat, B, upon the outside, with the tuning plug, C, back of the throat, substantially as and for the purpose described.

64,471.—CHURN.—Stephen Ballard, Sen., Sullivan, Ind.

First, I claim the combination of the knives, P, and hinged or jointed arms, N and O, with the dasher shaft, J, substantially as described and for the purpose set forth.

Second, The combination of the circular dasher, I, constructed as described with the dasher shaft, J, substantially as described and for the purpose set forth.

Third, The combination of the frame, E, and gearing, G H I, with each other and with the sides and top or cover, D, of the churn, A, substantially as described and for the purpose set forth.

64,472.—FRUIT PICKER.—John Bally, Deposit, N. Y.

I claim the jaws, A and B, constructed as described and provided with knife, C, shield, l, and spring, when used in combination with the socket, F, and bag, C, for the purposes specified.

64,473.—SOAP.—S. J. Beeler, Wales, Ill.

I claim the use of the ingredients herein named in the proportions substantially as set forth, when treated as described, for the manufacture of a new article of chemical erasive soap.

64,474.—LAMP.—Henry M. Beidler, Chicago, Ill.

I claim a metallic conductor to conduct heat from the illuminating flame of a lamp down into a tube or hollow case below, to rarefy the air therein, and cause an ascending current of air to feed the flame, substantially as described.

64,475.—HAND RAKE.—Calvin Bissell, Aurora, Ohio.

I claim the herein described rake in its special construction and arrangement in the manner and for the purposes specified.

64,476.—COFFEE POT.—John Blackie, New York City.

First, I claim a coffee pot constructed with the three compartments, A' B' and E, and the tubes, C and D, or their equivalents, in combination, to produce the effects set forth and described.

Second, A coffee pot, constructed with an inner and outer receptacle communicating with each other, so that the water shall be heated in the outer and then pass in to the inner, and so that the vessel containing the solution of coffee shall be surrounded by an air or water space, and the said solution thereby prevented from being heated to the boiling point, substantially as set forth.

Third, The leaching vessel, G, and tube, H, provided with the cap, I, in combination with the tube, D, and chambers, B' and E, substantially as and for the purposes set forth.

Fourth, The siphon, C, in combination with the compartments, A and B, and the tube, D, substantially as and for the purpose set forth.

64,477.—BENCH PLANE.—Benjamin A. Blandin, Charlestown, Mass.

I claim combining with a mechanism for clamping a plane iron in position, the rocking bed piece, l, supported and rolling in a concave seat, k, and serving to support and adjust the cutting edge of the plane iron, substantially as set forth.

64,478.—HOLLOW AUGER.—George E. Booth, Seymour, Ct.

First, I claim the circular cutters, D, pivoted eccentrically with the axial center of the auger, and operated substantially as and for the purpose specified.

Second, The plate, E, with the rack, c, and pinion, b, arranged substantially for the purpose set forth.

Third, The thimble, F, in combination with the barrel, A, and the cutters, D, substantially as described.

64,479.—STEAM GENERATOR.—Edward Bourne, Pittsburg, Pa.

I claim so arranging and combining the tubes with relation to the fire box and the water space therein, as that the smoke or products of combustion not only pass through the interval tubes, but can be made to pass around the outside of and between the external tubes or surrounding cylinders, substantially as herein shown and set forth.

64,480.—IRONING BOARD AND CLOSET.—James N. Brewster, Brooklyn, N. Y.

I claim the ironing board constructed with a hinged slide, e, arranged to operate in the guides, b, and in relation with the bars or stops, f and n, substantially as herein set forth for the purpose specified.

64,481.—PEGGING MACHINE.—B. Q. Budding, Milford, Mass.

I claim, in combination with the vibrating awl and the peg tube, the retainer tooth, f, so arranged in relation to the awl that the awl will be driven into the hole previously made by the tooth, substantially as and for the purpose set forth.

64,482.—HAY LOADER.—Jonathan Bullis, Macedon, N. Y.

I claim the arrangement of the detachable hollow crane post, P, elevating cord, C, drum, D, and vibrating pulley shaft, S, with its sliding box, f, and lever or connection bar, l, and the pulley, p, in connection with the driving wheel, w, attached to the ground wheel, G, of the wagon, when said parts operate in the manner and for the purposes shown and described.

64,483.—SIGNAL WHISTLE.—F. S. Burditt and O. Preston, Haskinsville, N. Y.

First, We claim the valve, E, cylinder, C, piston rod, D, and cord, I, all combined and operated as and for the purpose set forth.

Second, The sliding plate, G, spring, H, roller, J, and pulley, K, all combined and operated as and for the purpose specified.

64,484.—BUCKET EAR.—Henry Callahan (assignor to himself and John Reese), Dayton, Ohio.

I claim the bucket ear, B, when constructed substantially as described.

64,485.— HOT-AIR FURNACE. — Edwin H. Camp, Jackson, Mich.

I claim the two tiers of tubes marked a and c, in combination with the space, D, substantially as described for the purposes specified and in combination with the furnace.

I claim the diving flue, E, and the bent tubes, F, arranged substantially as described in combination with a hot-air furnace.

64,486.—DOOR STRIP.—George W. Carpender, Jarvis, Ind., assignor to himself and P. C. Stuart.

I claim a hinged weather strip, C, which in closing the door is raised by the guide, E, over the threshold and forced into a vertical position by pressure against the jamb, against which it rests in front of the threshold when the door is closed, substantially in the manner set forth.

64,487.—ATMOSPHERIC RAILROAD.—A. H. Caryl, Groton, Mass.

First, I claim the tube, arranged as specified, for the holding of compressed air, in combination with tanks or reservoirs on the cars which supplies the engines that propel the cars, substantially as described and for the purpose specified.

Second, I claim the iron tube placed on iron columns or otherwise suspended or supported above the carriage way to support a railroad track or tracks, as set forth, when such tube is strengthened by a vertical iron partition or when made with perpendicular walls, in the manner described for the purpose specified.

Third, The combination of the pipe, B, rings, C, ways, D, bars, E, bars, F, diagonal arms, G and rods, H, and pillars, A, in the manner described for the purpose specified.

Fourth, The supply tubes, O, in combination with bosses, P, arms, Q, and sliding tubes, R, operating with the tube, S, and admitting the compressed air into the receptacle, N, substantially as described as and for the purpose specified.

64,488.—PICTURE FRAME.—Lewis S. Chase, New York City.

I claim the frame for advertising and other purposes constructed with the bars removable or detachable by unscrewing the button and the other bars with grooves for allowing the glass to be removed, and arranged substantially as herein recited.

64,489.—SHOE LACER.—William H. Christie, Albany, N. Y.

I claim the hook doubled at the stem and curve with the ends thereof projecting below the stem for inserting through the shoe or other article and clamping thereto when formed of one strip of metal, and constructed and arranged as herein specified.

64,490.—CHURN POWER.—John Christley, Slippery Rock, Pa.

I claim the combination of the walking beam, D, handle, H, vertical bar, E, pendulum rod, K, treadle, I, connecting rod, C, spring, L M, dasher rod, F, and fly wheel, substantially as described for the purpose specified.

64,491.—PISTON PACKING.—C. H. Clark, Wilmington, Del.

First, I claim the packing rings, B and C, of wedge-shaped form with the recess, i, between their faces and with the saw parted and slotted ends in combinaton with a piston.

Second, The valves, a and b, in combination with the packing rings and the apertures through the piston head, substantially as described.

64,492.—SASH STOP.—Calvin Cole, Ithica, N. Y.

First, I claim the combination of the friction wheel, b, having a limited sliding movement with the friction bearing or surface, c, and the sustaining cord, d, substantially as herein described for the purpose specified.

Second, The combination of the slotted adjustable piece, e, with the sustaining cord, substantially as herein described for the purpose specified.

64,493.—COMPOSITION ROOFING.—M. Converse and A. C. Torry, Jordon, N. Y.

We claim the mode of covering roofs by coatings of felt and a mortar composed of the ingredients named, and compounded, combined and applied substantially as set forth.

64,494.—TOOL HOLDER.—E. W. H. Cooper, Hartford, Conn.

I claim the chuck, B, either sectional or split in combination with the conical socket, a, in the tool holder, A, constructed and operating substantially as and for the purpose set forth.

64,495.—SCREW SWEDGING MACHINE.—E. Cope and J. R. Maxwell, Cincinnati, Ohio.

We claim, First, Constructing said rolls with right and left-hand screws respectively and arranging them so that the threads upon one shall bend the metal into the grooves of the other, all substantially as above set forth.

Second, Also in combination with the subject matter of the first claim, we claim leaving a portion of the surface of the rolls plain or blank, in the manner and for the purpose described.

64,496.—METALIC BURIAL CASE.—Martin H. Crane (assignor to Crane, Breed & Co.), Cincinnati, Ohio.

I claim, First, A metallic burial caskat stiffened by sheet metal drawn over wood and secured to the body of the case by soldering, in the manner and for the purpose set forth,

Second, The combined arrangement with the body proper of the wood and metal rim or rail, C, for the reception of the screws employed to fasten the lid in the described combination with the composite wood and metal styles, the said rail sill and styles being formed separately from said body, and the sills, B, and afterward firmly soldered thereto and to each other, as set forth.

64,497.—STEAM CONFECTION PAN.—George H. Cross, Montpelier, Vt.

I claim the hollow shaft, D, attached to the pan, the steam pipe, E, passing through the shaft, the reversed T G, and the pipes, H and J, in combination with a steam confectioner's pan, the whole constructed, arranged and operating substantially as herein shown and described.

64,498.—MACHINE FOR CUTTING TOBACCO.—J. W. Crossley, Bridgeport, Conn.

I claim, First, The radius arm, E, fixed plate, e, provided with the curved slot, d, the lever, G, and pin, c, cam, M, and knife bar, D, all arranged in the manner substantially as and for the purpose set forth.

Second, The screw, T, with the plunger, U, attached nut, S, ratchet wheel, V pawl, W, and arm, R, all combined and arranged to form the feed mechanism, as set forth.

Third, The adjustable rod, N, and screw bolt, n, for the purpose of regulating the throw of the pawl, W, as set forth.

64,499.—APPARATUS FOR EXTRACTING OIL FROM HERBS AND FOR OTHER PURPOSES.—L. Daubert, Louisville, Ky.

I claim the annular chamber, C, with the furnace or fireplace, B, within said chamber in combination with the pipes, D E, and boiler, A, arranged as and for the purpose set forth.

64,500.—STEAM-ENGINE GOVERNOR.—G. W. Davis and G. A. Rollins, Nashua, N. H.

We claim the revolving eccentries, K, lifters, J, links, l, arms, g, in combination with the governor for the purpose of operating steam valves, as substantially herein set forth.

64,501.—CARRIAGE SPRING AND COUPLING.—Thomas De Witt, Detroit, Mich.

First, I claim the spring, F, having shoulder f2, in combination with the spring, D, and immediately secured to the axle, E, substantially as described for the purpose specified.

Second, The coupling, I, herein described the same consisting of the branches, 12 13 14 15, in combination with the half circle, H, constructed and arranged substantially as and for the purpose specified.

64,502.—ADDRESSING MACHINE.—Robert Dick, Buffalo, N. Y.

First, I claim the combination of the steam packing belt, with the distributors and the new arrangement of the rollers for securing the results as recited in the way and manner substantially as herein set forth.

Second, I claim the spring wire frame and the manner of connecting it with the machine for the purpose stated together with all other ways and manners, substantially the same as those herein set forth or intended to be set forth.

64,503.—EARTH AUGER.—Andrew J. Dine, Xenia, Ind.

I claim a post hole auger constructed with the parts, A D D' E E' F O G, arranged to operate substantially as set forth.

64,504.—BRICK MACHINE.—Thomas Dixcee, Woodville Road Engd.

First, I claim the crushing or grinding rollers, C, in connection with the amalgamation or mixing blades, D, and the rollers C, at the moulding orifice or orifices substantially as and for the purposes set forth.

Second, The cutting wires, a, attached to the bar, K, with the guide fences, L, L, combined and arranged to operate in the manner substantially as and for the purpose specified.

64,505.—MACHINE FOR POLISHING METAL SPRINGS.—A. B. Doolittle, Hartford, Conn., Assignor to Eli Terry, Terryville, Conn.

I claim the combination of the reels, A E, burring rollers, B, burnishing rollers, C, and bath, D, when all are respectively constructed and arranged to operate either in one and the same machine substantially as and for the purpose described.

64,506.—INTERFERING ATTATCHMENT.—Frank R. Doughty, New York City.

I claim providing the pad with the metallic spur or spurs so arranged by means of which and the straps, the pad is secured to the hoof of the horse as and for the purpose specified.

64,507.—CORSET FASTENINGS.—J. F. Dubber, Brooklyn, N. Y.

I claim the slides, C C,' made with lips, c c, to operate in combination with the springs, A A,' and seams, B B,' in the manner and for the purpose described.

64,508.—LAMP.—Michael B. Dyott, Philadelphia, Pa.

First, I claim a reservoir or fountain of glass, earthenware or other equivalent material suspended within the outer metal casing, B, substantially as and for the purpose herein set forth.

Second, The combination of the glass or earthenware reservoir, A, metal ring, D, brackets, g, and outer casing, B, the whole being arranged substantially as described.

Third, The cemented recess, f, the projecting upper edge, e, of the same and the ring, D.

64,509.—FENCE.—Freeman Ellis, Lafayette Chio.

First, I claim a fence provided with the parts, B, arranged and constructed so as to render it adapted for being inverted, that is used either side up substantially as and for the purposes set forth.

Second, The blocks, j j, when arranged upon and confined with the pins, h h, and pulleys, i i, as and for the purposes specified.

64,510.—MACHINE FOR MAKING NUTS.—A. Emerson, New York City.

First, I claim the construction and arrangement of the slides, I L, fitted in the guides, H K, of the frame, B, and provided respectively with the dies, J M, the punch, N, in the slide, L, and fixed rod, K, in the slide, L when used in combination with an intermediate die open at both ends, substantially as described for the purpose specified.

Second, The constructing of the die, T, with an enlarged centre when said die thus constructed, as used in connection with a punch arranged in connection with suitable dies so that in the punching operation the blank will be expanded in the enlarged part of the die, substantially as and for the purpose set forth.

64,511.—DEVICE FOR CONVERTING MOTION.—Bernhard Eybel, New York City.

I claim the arrangement of the elbow lever, F, eccentric, C, and crank I, in combination with the shafts, B H, substantially as and for the purpose set forth.

64,512.—CONSTRUCTION AND VENTILATION OF THE WALLS OF BUILDINGS.—Benjamin F. Farrar, (Assignor to himself, Edward M. Wesson and Henry Willis) Springfield Mass.

First, I claim the wall of a house or other building, when constructed with horizontal air-ducts, c c c, such air-ducts and their opening being arranged and combined substantially in the manner and for the purpose specified.

Second, I claim a break or building block, when constructed with a channel or groove extending the entire length of one or both sides as and for the purpose specified.

64,513.—STEAM GENERATORS.—Hector T. Fenton, Philadelphia, Pa.

First, I claim the cylindrical boiler its fire box, D, central flue, C, and pipes, E, the whole being constructed and arranged substantially as and for the purpose herein set forth.

Second, The combination of the above with a superheating chamber, H, situated above the central flue and communicating through pipes with the steam space of the boiler.

Third, The boxes, F, separated from the steam space by wire gauze or its equivalent and pipes, C, less in size than the boxes.

64,514.—POST DRIVING MACHINE.—C. T. Fitch, Harbor Creek, Pa.

I claim the combination of runners, A, posts, B, and braces, C, with the hook, I, inclined blocks, F, sliding guide bar, L, hammer, E, adjustable arms, O and P, sliding bar, N, and stop lever, R, substantially as herein set forth for the purpose specified.

64,515.—BEE-HIVES.—W. A. Flanders, Shelby Ohio.

I claim the ways or passages, G, for the bees commencing at one side of the comb guides, and passing through the top bars of the comb frames substantially as and for the purpose set forth.

Second, I claim the use of sanded surfaces for the comb frames as and for the purposes set forth.

Third, I claim the use of glassed or sanded paper for comb guides, M, and linings to the communicating bee passages, A,' from comb to comb substantially as and for the purposes set forth.

Fourth, I claim ventilating the hive through the top bars of the outside comb frames and proserver, H, constructed as described, from the diverging ways, W, and doors, X, and Y, of the common entrance as and for the purposes specified.

Fifth, I claim the bee entrance guard, V, having diverging passage ways, W, from the central or common ingress, Y, the same being either reversible or stationary as and for the purposes set forth.

64,516.—SHAFT COUPLING.—Henry C. Fritz, Philadelphia, Pa.

I claim a coupling divided into parts longitudinally when bolted together by bolts or screws through the flanges in combination with the sleeve or cover, H, substantially as shown and described.

64,517.—APPARATUS FOR CRUTCHING SOAP.—Joseph Gallipo (Assignor to himself and Walter Campbell), Cohoes N. Y.

I claim the arrangement of the radiating paddles, e, beater frame, f, transverse scrapers, g, cross bars, h, and transverse paddle, i, in combination with the revolving shaft, D, and box, A, constructed and operating substantially as and for the purpose set forth.

64,518.—HAY SPREADER.—Joel Garfield, Groton, Mass.

I claim in combination with rotating heads and forks and the stationary shaft, k, placed eccentrically to the axis of rotation of such heads the shafts, h, arms, l, and loops, m, when arranged to operate substantially as described.

64,519.—PLANTER AND CULTIVATOR COMBINED.—William L. Gebby, New Richland, Ohio.

First, I claim the arrangement of the arms, I I, with the shovel, K, and teeth, d d, in combination with the shaft, A, and beam B, in the manner and for the purposes specified.

Second, The hopper box D, with seed slide l, when operating by means of the lever, b, rods, c and g, and spring, e, when constructed and used in the manner herein set forth.

64,520.—HARVESTER RAKES.—William F. Goodwin, Washington, D. C.

First, I claim the jointed lever consisting of arms, A4 and A5, for communicating motion from gearing on the main frame to a rake moanted on the hinged finger bar, or platform arranged and operating substantially as described.

Second, The reciprocating bar, B, arranged in the described relation to the grain platform in combination with the vibrating arm, A5, and the rock shaft, B2, in the hollow post, P, or their equivalents substantially as and for the purpose specified.

Third, The bar, A3, arms, A4 and A5, bar B, shaft, B2, in the hollow post, P, crank arm, B3, link, B4, crank arm, B5, shaft, B6, post, B7, rod, R1, projections, R2, projecting arm M, track, E, and switches, T and T1, combined and arranged to opperate in the manner and for the purpose substantially as described.

Fourth, The post, P, having a hole made through it to receive and support the shaft, B2, in combination with the projecting arm, N, flattened on the top of said post, P, substantially as and for the purpose described.

64,521.—HARVESTER RAKE.—William F. Goodwin, Washington, D. C.

First, I claim the swinging bent arm, H H' mounted on the projecting arm of post, P, arranged and operating substantially in the manner and for the purpose described.

Second, The sliding bar, M, rods, C C,' and crank arms, K K3, or their equivalents operating in connection with the swinging arm, H, and rake, R, substantially as and for the purpose described.

Third, The sliding bar M, provided with roller, E, arranged as described, and operated by the track, T, substantially as and for the purpose described.

Fourth, The track, T, switches, S S, and yielding lever, L, arranged and operating substantially in the manner and for the purpose described.

Fifth, The lever, L, post, J, spring, J,' and stud, O, arranged and operating substantially as described.

64,522.—HARVESTER RAKE.—William F. Goodwin, Washington, D. C., and Arthur W. Browne, Brooklyn N. Y.

First, We claim the plate, P, with its recess W, the projecting stud, U, on the cam M, and the rod T, combined and arranged to operate in the manner and for the purpose substantially as described.

Second, Crank, S, rock shaft, S, crank arm, C1, link, C2, crank arm, C, rock shaft, B1, crank arm, B5, rod B4, and crank arm B5, combined and arranged to operate in the manner and for the purpose substantially as described.

Third, The projecting arm, O2, track, F, with its notches E E, pails q and q2, pins, q1 and q3, and hollow arm B, combined and arranged to operate in the manner and for the purpose described.

64,523.—HARVESTER REEL.—William F. Goodwin, Washington, D. C., and A. W. Brown, Brooklyn N. Y.

We claim the pulleys, A and A2, shaft, B, chains, I, bars, O, and projections, R and R1, adjustable on the posts, S S1, combined and arranged to operate with the pulleys A1 and A2, in the manner and for the purpose substantially as described.

64,524.—SAP SPOUT.—Luke Gore, Newbury, Ohio.

I claim the herein described sap spout when constructed in the manner specified as a new article of manufacture.

64,525.—LOOM.—John Graham, New York, N. Y.

I claim the shuttle at the side of the shed and the reciprocating filling thread carrier arranged in combination with the lay and reed so that the filling thread carrier crosses the shed at such distance from the cloth making point (or extreme range of motion of the reed in beating up the filling) as to carry the filling thread diagonally across the shed and shuttle race substantially as and for the purpose described.

64,526.—HEATING STOVE.—Jonathan H. Green, Christainsburg, Iowa.

I claim the arrangement of the grate C, above the bottom of the stove whose sides are open or slotted and provided with dampers P, to register therewith, and operating substantially as described as and for the purpose specified.

64,527.—DIFFERENTIAL PULLEY BLOCK.—Robert Anthony, Hardcastle of Newcastle on Tyne, Eng.

First, I claim the application and use of a sliding clutch for the purpose of coupling and uncoupling the sheaves in differential pulley blocks substantially in the manner hereinbefore described and illustrated by figure 1, of my drawings.

Second, The application and use of a sliding clutch for the purpose both of coupling or uncoupling the sheaves in differential pulley blocks and of locking one of such sheaves as hereinbefore described and illustrated by figures 11, 12, & 13, of my drawings.

Third, The application and use of lateral cogs, pins, projections or teeth on one sheave in combination with a fixed stop or catch on the frame of the pulley block both for the purpose of coupling and uncoupling the sheaves in differential pulley blocks and simultaneously locking one of such sheaves substantially as and for the purpose hereinbefore described and illustrated by figures 3 4 5 6 7 and 8, of my drawings.

Fourth, The application and use to and in differential pulley blocks of a sliding clutch or a sliding sheave in combination with a lever cord wedge or spring for producing the necessary motion for coupling and uncoupling and locking the sheaves substantially as hereinbefore described and illustrated by figures 1 2 3 and 4, of my drawings.

Fifth, The application and use in differential pulley block of one or more spiral projections or threads formed on the spindle or axis of the sheaves and being in combination with inclined teeth or projections on one of the sheaves and on the frame on the pulley block for the purpose both of coupling and uncoupling the sheaves and locking one of such sheaves as hereinbefore described and illustrated by figures 9 and 10 of my drawings.

64,528.—BED BOTTOM.—Cyrus H. Hardy, Charleston, Mass., assignor to himself and George Jaques, Boston, Mass.

I claim the series of coiled lever springs E, operated by pins D, or their equivalents substantially in the manner and for the purpose set forth.

64,529.—SKATE SHARPENER.—W. F. Hellen, Washington, D. C.

I claim the slotted guide plate B, with the adjustable screws D, and set screw E, combined with an adjustable file of any required size when constructed arranged and operated as herein described and for the purposes set forth.

64,530.—CORSET.—Edward Drucker, Paris, France.

I claim an improvement in corsets of the class in which the seams run transversely instead of up and down, such improved corset or other similar article being made of two or more sections united by an intermediate section having substantially the outline and confirmation shown and described.

64,531.—MAKING TIN COATED FOIL.—Dauphin S. Hines, Brooklyn, N. Y., assignor to John J. Crooke, New York, N. Y.

I claim forming the ingot by pouring molten lead into a tin pipe while immersed in a cooling medium, substantially as described in combination with the after process of rolling as set forth.

64,532.—STEAM ENGINE SLIDE VALVE.—Alfred Hobbs, West Cambridge, Mass.

I claim a semicircular balanced slide valve constructed and operating substantially as and for the purposes herein specified.

64,533.—LOCOMOTIVE TRUCK.—William S. Hudson, Paterson, N. J.

First, I claim the two trucks M N, constructed and arranged as represented and mounted at opposite ends of the locomotive substantially as and for the purpose herein specified.

Second, I claim in connection with the above the within described arrangement of the equalizing levers H, h, so as to equalize between the rear drivers C, and the top portion of the truck N, and allow the lateral movements of the main body of the latter without disturbing the action of the equalizing levers, substantially as herein set forth.

Third, I claim the equalizing lever G, g, and cross lever E, mounted on the front of the locomotive and arranged relatively to the truck M, and forward drivers D, substantially as represented so as in connection with the lateral moving truck N, at the rear and the equalizing levers H h, connected therewith to support the weight on the three points g h h, on independently equalizing systems of levers and wheels, substantially as and for the purpose herein set forth.

64,534.—AMALGAMATOR.—Andrew Hunter, San Francisco, Cal.

First, I claim the box A, with sides and ends lined with copper in combination with the blocks B B, and dies C C, substantially as described.

Second, The frame E, with shoes or mullers D D, suspended to frame F, by rods or bars G G, or their equivalent worked by rod J, and crank or eccentric K, as hereinbefore set forth.

Third, I claim the movable frame F, with adjusting screws I I, or their equivalent for adjusting mullers D D, to any desired hight.

Fourth, I claim covering the tops of the mullers D D, with copper.

Fifth, I claim box L, with frame M, set with skimmers and agitators, substantially as described and for the uses and purposes as hereinbefore set forth.

Sixth, I claim table O, with steps covered with copper plates, with side vibratory motion as given by driver P and rod Q.

Seventh, I claim the box A, lined with copper plates, in combination with blocks B B, dies C C, mullers D D, adjusting or movable frame F, screws I I, rod J, crank or eccentric K, box L, and frame M, with agitators or skimmers, substantially as described, and for the uses and purposes as hereinbefore set forth.

I claim the last described combination in connection with the table O, with its side vibrating motion, substantially as described and for the uses and purposes as hereinbefore set forth.

64,535.—FOLDING CHAIR.—Joseph Hyde, Troy, N. Y.

First, I claim the connecting and disconnecting of the legs G, or F, from the main part or body of the chair or couch in the manner, and by the means, or equivalent means, herein specified, thereby allowing the said chair or couch to be folded in a compact form, without disconnecting the back, seat or apron from each other, substantially as herein described and set forth.

Second, I claim the employment of the circular hook or latch fastening M, arranged in combination with the legs or other suitable part of a folding chair or couch, and operating in the manner and for the purposes substantially as herein specified and set forth.

Third, I claim the rollers E, in combination with the foot board P and apron E, of a folding chair or couch when arranged in the manner and for the purposes substantially as herein described and set forth.

64,536.—RAILROAD RAIL.—Isaac B. Hymer, Warsaw, Ind.

I claim the arrangement of the T-rail imposed upon the foot rail and the two side plates bolted thereto the contacting face of the shank a, rib b, and side plates C C, being grooved as described and represented.

64,537.—MACHINE FOR MAKING PAPER BAGS.—G. L. Jaeger, New York, N. Y.

I claim the former, B, in combination with the table A, gage C, and flaps D D', worked and operating substantially as and for the purpose described.

Also the notch e, in the edge of the former to facilitate the operation of removing the finished bags from said former as set forth.

64,538.—BOOT CRIMPING MACHINE.—Samuel W. Jamison, New York, N. Y.

First, I claim the combination in a machine for crimping boots, having a stationary tree or form of the crimping plates with the brackets for supporting the same, under the arrangement herein described so that the said plates may adjust themselves vertically or laterally to the varying thickness of the leather or tree upon which it is plased substantially as shown and set forth.

Second, The combination with the crimping plates and brackets for supporting the same of the laterally self-adjusting ways between which the said brackets slide, the said ways being actuated by weights, springs or equivalent mechanism to exert a continuous but yielding pressure upon the said crimping plates as herein shown and described.

Third, The method of supporting the said crimping plates, and the suporting brackets moving between laterally self-adjusting ways as described, from a cross head or beam sliding between the sides of the machine and receiving motion, through the medium of gear or lever or other suitable mechanism substantially as herein shown and set forth.

Fourth, The combination with the self adjusting ways or uprights of the levers and rods connecting the same with both the said uprights and the wheels under the arrangement and for operation substantially as shown and set forth.

64,539.—WATER EJECTOR.—Thomas J. Jones. Madison, N. J.

I claim the pump constructed as herein described and shown, as a new article of manufacture.

64,540.—FEED WATER HEATER.—Peter M. Kafer and Joseph M. DeLacy, Trenton, N. J.

We claim a water heater for steam fire engines, constructed substantially as shown and described combining in its arrangement the regulating cylinder N, operating upon the damper substantially as set forth.

We claim the pipes B B', and the rubber or elastic pipes K, with their cocks, levers and chains, the slip joint at L, and the slip key E', constructed arranged and operating substantially as described and for the purposes specified.

64,541.—RAILWAY TRACK CLEARER.—Watson King, Springfield, Ill.

First, I claim operating the shields D, and brake shoes G, by means of the eccentrics H, upon the shaft C, substantially as herein shown and described for the purpose specified.

Second, In combination with the parts of the above, I claim the rods I, cross bar J, chains K, P, friction roller L, cross bar O, and openings S T, as herein set forth for the purpose specified.

64,542.—CULTIVATOR.—Edmond H. Knight, Unadilla, Mich.

First, I claim the beams G, having plough or shovel standards H, pivoted to them in combination with the frames F F, the beams and frames being secured to the axle A, and used in connection with hand levers K, foot levers S S, and catches R V, all arranged to operate substantially in the manner and for the purpose set forth.

Second, The springs, H* connected with the beams, G, and attached to the frames, F, substantially as and for the purpose specified.

64,543.—MACHINE FOR CLASPING HOOKS TO LADIES' SKIRTS. A. Komp, New York City.

First, I claim reversing the spangles by the action of the spangle carrier, substantially as shown.

Second, The slotted spring receiver, g, in combination with the swinging spangle carrier, E, constructed and operating substantially as and for the purpose described.

Third, The lips, f, on the spangle guide, D, in combination with the slotted spring receiver, g, and oscillating spangle carrier, E, constructed and operating substantially as and for the purpose set forth.

Fourth, The bell crank lever, m, and stop, n, in combination with the spring receiver, g, oscillating spangle carrier, E, and hammer, H, constructed and operating substantially as and for the purpose described.

64,544.—GAS BURNER FOR HEATING PURPOSES.—Hiram Y. Lazear, New York City.

I claim the combination of the supporting tube, A, trough, B, dish, C, and perforated cylinder, D, with the central air tube operating as described, for the purpose specified.

64,545.—TURN-TABLE FOR RAILROAD.—L. E. Lee and C. Mudge, New Orleans, La.

We claim the combination of projecting points, b b' b" and g g g' g', and the openings or recesses into which they enter, the pivoted levers, c c' c" and d and f f', with a railroad turntable, when the said parts are constructed and aranged for conjoint operation, substantially as described, for the purpose set forth.

64,546.—WELL TUBE.—Tristram S. Lewis, Chelsea, Mass.

I claim the tube, A, provided with one of more short perforated tubes, b, operating substantially as described for the purpose set forth.

64,547.—CAR COUPLING.—Elijah Lindsley, Neenah, Wis.

I claim the sliding bar, B, with its slot, b, and pivoted pin, A, playing into the tapering slot, D, and fastening into the hole in the spring plate on top of the coupling, substantially in the manner and for the purposes described.

And also in combination with the said slide and pin the said spring plate and lever, and other parts of the said coupling, substantially as set forth.

64,548.—GATE.—John McCreary, Middletown, Pa.

I claim a gate having a central cross bar, E, with the recesses formed on its inner surface, when used in combination with the grooved and swiveled roller, d, and the right angled hook, f, substantially as shown and described.

64,549.—WELL TUBE.—A. T. McDonald, Dubuque, Iowa.

I claim the pipe, A, perforated as described and wrapped with the coarse wire after being first wound with the finer wire, in the manner substantially as and for the purposes specified.

64,550.—HORSE RAKE.—Wm. H. McPherson, Danby, N. Y.

First, I claim the revolving tubular head, J, provided with the teeth H' and H'', in combination with the cam wheel, E, spring stop, D, and lever, C, substantially as and for the purposes described.

Second, I claim the combination of the teeth, H' H'', having a double right angled bend at their upper ends, the bolts, P, and head, J, substantially as and for the purposes described.

Third, I claim the use of the wheels, I and K, acting on the head, J, and moved by the hand rims, L, or its equivalent, for the purposes set forth.

64,551.—GATE.—P. L. Miller, Mechanicsburg, Pa.

First, I claim the end piece, G, provided with slotted arms, G', in combination with levers, F F', pin, I, and rods, J J', as and for the purpose set forth.

Second, The rod, J, provided with an enlargement or enlargements, a a', substantially as and for the purpose described.

Third, The pivoted latch, K, in combination with the lever, H, rod, L, rod, J', and bracket, d, as and for the purpose described.

Fourth, The combination and arrangement of the posts, A D D' E E', and bed piece, substantially as and for the purpose set forth.

64,552.—JOINT FOR STOVE PIPE.—D. L. Milliken, Brattleboro, Vt., and O. M. Pillsbury, Claremont, N. H.

I claim the adjustable band, B, provided with circumferentially swaged grooves, b, fitting over the corresponding heads, c, near the ends of the sections, A, of the stove pipe, as herein shown and described for the purpose specified.

64,553.—PEAT MACHINE.—H. C. Moore, Springfield, Mass. Antedated March 26, 1867.

First, I claim the combination of the die and press so as to co-operate with each other to cut, press, and shape the peat to the desired form, substantially as herein set forth.

Second, The combination of the endless belt, E, and plate, F, with the die, A, and press, B, the parts arranged so as to operate automatically, substantially as and for the purpose herein described.

Third, I claim the arrangement of the box, L, for the peat to pass through, so formed as to gage the amount passing through to the proper hight for the movement of the die, substantially as set forth.

Fourth, I claim for the purpose of moving the press, A, the arrangement of the slotted lever, m, and crank, K, on the shaft, H, substantially as set forth

Fifth, For the purpose of moving the die, the combination of the slotted levers, c c', and cams, b b', upon the shaft, H.

Sixth, I claim operating the draw, K, by the ratchet motion arranged and operated by means of the lever, n, and cam, T, upon the shaft, H, substantially as herein set forth.

Seventh, I claim in a peat machine the combination of rolls for grinding, and endless belt for conveying the peat, and die and press for shaping and compressing the same, substantially as herein described.

Eighth, I claim the arrangement of the openings, X X', as described, for the purpose of letting out the steam confined within the rolls intermittently.

Ninth, The box or cap, X', in combination with the die, A, for the purpose of holding the steam used for warming the die and peat operated by it, substantially as herein described.

Tenth, I claim warming the die, A, and plate, F, upon which the peat is pressed and formed, by means of steam or hot air, substantially as set forth.

64,554.—FRICTION PAWL.—Joseph Moore, San Francisco, Cal.

I claim a stop apparatus for hoisting machinery constructed with the pawls, Q Q Q, moving with the shaft, F, and the ratchet case, R, turning loosely upon said shaft together with the brake beams, L L, levers, T and V, and weight, Z, constructed and operated substantially as and for the purpose described.

64,555.—MANUFACTURE OF SOAP.—Pierre B. Mongeot, Paris, France.

I claim manufacturing the above described soaps, which go by the names of anhydrous rectified soaps, illustrated soaps, double-faced soaps, obtained by one and the same process, that is to say, with anhydrous soap, which alone allows of the fabrication of a block or cake composed of parts of different nature, colors, and perfumes united together in the manner of mosaic work, as and for the purposes described, viz., having in one and the same block or piece heterogenial soaps made to answer various purposes, or variously illustrated and perfumed soaps, substantially as described.

64,556.—BELT PUNCH.—John Mulchahey, Springfield, Mass., assignor to himself and Charles Mulchahey.

I claim the arrangement of the awl, M, projections, H H', knife, K, spring hook, O, and bodkin, S, upon and in connection with a belt punch, substantially as set forth.

64,557.—BEE HIVE.—P. M. Myers, J. W. Walser, and John Spangler, Canton, Ohio. Antedated Nov. 7, 1867.

First, We claim the use of the four pieces, C C D D, forming a complete hopper, C D C D, when the pieces, C C, are movable in grooves, a a, substantially in the manner and for the purpose specified.

Second, The peculiarly formed bee valve, N, used in connection with the openings, R, substantially in the manner and for the purpose specified.

Third, The peculiar combination and arrangements of double box, A, having the boxes, H H, honey boxes, K K K K, ventilators, X, opening, E E, slides, F F, openings, R R, hoppers, C D C D, drawers, O, doors, B B and I I, arranged on each side thereof, and cover, G, substantially in the manner and for the purpose specified.

64,558.—POT FOR MELTING GLASS.—Carlton Newman, San Francisco, Cal.

First, I claim a pot, A, constructed with the opening, F, and flues, D D, or their equivalents, substantially as and for the purposes described.

Second, the flues, H H, or their equivalents, constructed and arranged substantially as and for the purpose described.

64,559.—FIELD ROLLER.—E. F. Olds, South Lyons, Mich.

First, I claim the disk, A, pole, G, lever, H, and spring, I, as arranged in relation to a field roller, in the manner substantially as described.

Second, Rollers, D, spring, E, and frame, B, in combination with the disk, F, pole, G, lever, H, and spring, I, in the manner and for the purpose set forth.

64,560.—COMBINED WAGON BRAKE AND DUMPING DEVICE.—L. M. Osborne, Hamilton, N. Y.

First, I claim a wagon which dumps itself by approximation of its front and rear wheels; I claim the employment of a self-acting brake which is constructed substantially as described, and connected to the front section, D', of the extensible reach by a locking latch or its equivalent, substantially as described.

Second, The transverse releasing lever, g', in combination with the latch or hook, g, and a self-acting brake, substantially as described.

Third, The combination of brake bar, F, toggle or knee levers, e e, pivoted blocks, f, and brake shoes, f', with an extensible reach, D D D', and a fastening g, substantially as described.

Fourth, The brace strap, c, applied to the front running gear by the king bolt, b, and adapted for sustaining the same when backing, substantially as described.

Fifth, The sliding brace, d, and stops, d1 d2, applied to the reach sections, D D', substantially as described.

Sixth, The connecting rods, P, applied to the wagon body and front running gear, in conjunction with the rolling supports, G G, and the extensible reach, D D', substantially as described.

64,561.—DIE FOR SWAGING CALKS FOR HORSE SHOES.—Philip A. Page (assignor to himself, Wm. Brooks, and Albert Loomis), Palmer, Mass.

I claim a toe calk die constructed with the piece, B, arranged in the block, A, substantially as set forth.

64,562.—APPLYING DESIGN IN RELIEF AND BRILLIANCY TO WOVEN FABRICS.—Francis Petildidier, Paris, France.

I claim the application or production of designs upon and giving brilliancy to fabrics by printing with resinous materials, substantially as herein specified.

64,563.—CULTIVATOR.—Edward Phifer, Trenton, N. J.

First, I claim a cultivator frame composed of a series of timbers shorter than the diameter of the wheels and arranged parallel to the tongue, substantially as described.

Second, The combination substantially in the manner described of a tongue laterally adjustable on the axle with a series of frame timbers of a length less than the diameter of the wheels, arranged parallel to the tongue and adjustable laterally on the main axle.

Third, The combination substantially as described of the tongue and short parallel frame timbers with a series of slotted adjusting plates attached to the front of the frame timbers and secured to the tongue.

Fourth, The combination substantially in the manner described of the parallel frame pieces arranged for adjustment in pairs with the slotted down-hangers, front lifting rods, and drag bars, for the purpose of adjusting the front ends of the drag bars.

Fifth, The combination of the frame pieces, down hangers, drag bars, lifting rods, hand levers, and sector rack, when arranged substantially as described, for the purpose of enabling the driver to control each pair of plows by a single lever.

Sixth, The arrangement of the sector rack, hand lever, and spring detent, as described, whereby the catch acts both as a detent for the lever, and as a guide to keep it parallel with the sector rack.

64,564.—HOLLOW ARTICLES OF RUBBER AND OTHER FLEXIBLE MATERIALS.—Leonce Picot (assignor to Wilhelmine Picot), Hoboken, N. J.

I claim the application to an india-rubber ball or other hollow article required to be distended by inflation, of a flexible tube in the manner as herein specified, so that the said ball or other article may be either inflated and distended or collapsed, as and for the purposes set forth.

64,565.—ATTACHING THILLS TO VEHICLES.—Edwin R. Powell, Cambridge, Vt.

First, I claim an improved thill coupling formed by the combination of the chambered block, A, spring, D, and the pivoted plate or cap, C, having projections, c1 c2 and c3, formed upon its under side, substantially as herein shown and described and for the purpose set forth.

Second, The combination of the india-rubber block spring, E, or equivalent, with the chambered block, A, and cap or plate, c, substantially as herein shown and described and for the purpose set forth.

64,566.—ROOFING.—Seymour Pratt, Fayetteville, N. Y.

I claim a roofing composed of the tiles, D, constructed as described, placed on a bed of cement, C, laid on the boards or lathes, B, substantially as herein shown and described.

64,567.—POWER HAMMER.—Thomas F. Preston, Pawtucket, R. I.

First, I claim the connecting rods, E and D, in combination with the springs, e and f, shoulder, d, and slotted hammer (or extension of the same) F, substantially as and for the purpose herein shown and described.

Second, The construction and arrangement of the adjustable guide, C, let into the guide brace, G, and provided with a lip upon each end fitting over the upper and lower sides of said guide brace, G, its center grooved to receive the sliding guide rail, b, in the hammer, F, substantially as herein described and for the purpose specified.

64,568.—LOCK.—H. D. Richardson (assignor to himself and Robert Russell), Northampton, Mass. Antedated April 24, 1867.

First, I claim a lock constructed and arranged substantially as described so that the key hole can be brought to either side of the door leaving no entrance to the lock on the other.

Second, The arrangement of the two cylinders, B and K, with the key holes, e e' and g, in the manner and for the purpose substantially as described.

Third, The combination of cylinders, B and K, rack, C, pinion, H, spring, E, one or more tumblers, a a a, and bolt, A, in the manner and for the purpose substantially as set forth.

Fourth, A lock constructed and arranged substantially as described so that the key hole can be brought to either side of the door leaving entrance to the lock on the other.

64,569.—FIRE ESCAPE.—Allred Rigny, New York City.

First, I claim the flexible ladder, H, arranged in a box or case, A, so that it can be wound around a drum or roller or be straightened for use as may be desired, substantially as herein shown and described.

Second, The strap or bolt F, when arranged as described in combination with the flexible ladder, H, all made and operating substantially as herein shown and described.

Third, The springs, I I, when arranged as described in combination with the sleeves, O, and hinged side pieces, n n, all made and operating substantially as and for the purpose herein shown and described.

Fourth, A fire escape made and operating substantially as herein shown and described.

64,570.—REVERSIBLE KNOB LATCH.—Henry M. Ritter (assignor to M. Greenwood & Co.), Cincinnati, Ohio.

In the described combination with the hub, B, guiding stump, M, and spring, F, I claim the reversible latch, I J, adapted for retention to a right or left position by direct contact of its yoke, C K, with one of the wood screws employed to fasten the lock to the door, substantially as set forth.

64,571.—REVERSIBLE KNOB LATCH.—Henry M. Ritter (assignor to M. Greenwood & Co.), Cincinnati, Ohio.

I claim the reversible latch, A D, whose reversible collar, B, occupies a corresponding socket, C, and whose flat two-sided tail, G, is tangential to one of the screw holes in both positions of the latch so as to render the latter irreversible by the direct contact of the holding screw, substantially as described.

64,572.—ROTARY KNITTING MACHINE.—Mark L. Roberts, Chatsworth, Ill.

I claim, First, Actuating the needle operator through the bar, W, to which it is attached, the bar being supported in suitable bearings and receiving its movement through the medium of a vertical slotted arm, V, and a pin or stud, U, of the revolving wheel or disk, T, or its equivalent, when the whole are arranged together substantially as and for the purpose described.

Second, The needle operator, T, notched or toothed carrying bar, W, and screw nuts, A2, when all are combined together substantially as and for the purpose described.

Third, The combination of the thread puller, A2, with the looped upright, Z2, of the needle actuator, Y, the whole operating substantially as described.

Fourth, The double cam way or groove, H2, for operating the yarn presser, when connected with the same substantially in the manner and for the purpose described.

64,573.—LOOM.—Thomas Robjohn, New York City, assignor to the American Needle Loom Company.

I claim, First, In combination with a needle for carrying the weft thread through the warp in a loom, a shuttle so applied and actuated as to operate in an arc or a circle parallel to the plane of the warp that in approaching to enter the loop of the weft yarn it moves nearly parallel with and close to the selvage of the web being woven, and afterwards gradually moves away from the warp so that in completing its movement at the same time as the needle completes its retiring movement it pulls its yarn or thread tight in a direction transverse to the warp, substantially as and for the purpose herein specified.

Second, The weft retractar, Z, applied to operate on the weft, substantially as and for the purpose herein described.

Third, The arrangement of the upright shaft, M', and its crank, and eccentric in relation with the warp whereby they work the needle holder and shuttle carrier at opposite sides of the warp by direct rod connections, substantially as herein specified.

64,574.—CAR COUPLING.—Charles F. Rodrick, Lynn, Mass.

I claim, in combination with the draw bar of a railway carriage, the spring latch bars pivoted to the draw bar, as described, and recessed at their outer ends in such manner that when they are brought together the tongue of the one shall fit in the groove of the other, substantially as shown and set forth.

64,575.—MACHINE FOR WASHING HIDES.—Alexander Ross, Maine, N. Y., assignor to himself and John Fell, New York City.

I claim the wheel, A, for washing hides closed at both ends and having its sides open at various points, its interior divided into compartments, B, by close partitions, C, having ribs, D, extending in the direction of their length, the said wheel provided with hollow journals through which the washing liquid is introduced, when all are constructed and arranged to operate substantially as herein shown and described.

64,576.—CULTIVATOR.—John E. Rowland, Hagerstown, Md.

I claim the above-described cultivator, the beams, C, levers, N, and stirrup lever, M, being all arranged and combined substantially in the manner and for the purposes set forth.

64,577.—MACHINE FOR FORMING BOILERS.—E. S. Sackett, Monroe, Wis.

I claim, First, The former, A, when made substantially as herein shown and described and for the purpose set forth.

Second, The grooved and notched board, plank, or bench, B, when made substantially as herein shown and described in combination with the former, A, as and for the purpose set forth.

Third, The combination of the clamps, C, with the former, A, substantially as herein described and for the purpose set forth.

64,578.—LAMP EXTINGUISHER.—Mark Safford, Boston, Mass.

I claim so applying the extinguisher to the burner that its movements shall be actuated by the wick-elevating shaft and by the same act which raises and lowers the wick, substantially in manner and for the purpose as described.

I also claim the device for causing the above-described movement of the extinguisher consisting of the finger, h, and cam, i, applied to the shafts g and d, the extinguisher being moved in one direction by the spring, j, the whole being arranged and operating together in manner as above set forth and explained.

64,579.—CAR WHEEL.—Elnathan Sampson (assignor to himself and Edwin Chamberlin), Lansingburgh, N. Y.

I claim a railroad car wheel having the conical tread surface, c, cast with the flat tread surface, d, and with the guiding flange, f, in the manner and for the purposes substantially as herein described and set forth.

64,580.—CULTIVATOR.—J. D. Schultz and Reuben Adams, Robesonia, Pa., assignors to themselves and John McKnight.

We claim, First, The arrangement of the frame, A, with its shafts, G, arms, I I, bars, b b, and springs, a a, with rakes, d, when operated in the manner and for the purpose set forth.

Second, The elevation or depression of the frame with its cultivators by means of the bar, g, and levers, y, attached to the thill, c, in the manner, substantially as and for the purposes specified.

64,581.—MACHINE FOR CUTTING BUNGS.—John G. Schmidt, Rochester, N. Y.

I claim, First, The safety plates, o o, in connection with gage, k, screw, p, and nuts, e e, all for the purpose and in the manner herein described.

Second, The head, q, of a yielding center, b, with hole, m, the holes, m m m, in mandrel, a, and the pin, n, all for the purpose and in the manner herein described.

64,582.—CORNET, ETC.—Lewis Schreiber, New York City.

I claim the form given to the instrument as herein described by means of which the sound is discharged from the bell in an upward direction, while the weight of the instrument can rest on the shoulder of the performer, while the part to be held by the left hand and the keys are in front in position which will enable the performer to have an easy control thereof, as described.

I also claim the rotating water valve and its case in combination with and located at the lower part of the curved pipe between the mouth piece tube and the tone valve tube as and for the purpose described.

And I also claim the india-rubber segment stops attached to the inner face of the cap plate of valve cases in combination with the rotating valves, as and for the purpose described.

64,583.—MACHINE FOR CUTTING SHEET METAL.—Charles H. Schenbens (assignor to Samuel Lagowitz and Isadore Lehman), Newark, N. J.

The arrangement of the parts, a a' b, formed as shown and secured to the tool holder, C, in combination with the knife, D, constructed and operating substantially as and for the purpose described.

64,584.—METAL BENDING METAL.—Charles H. Schenbens (assignor to Samuel Lagowitz and Isadore Lehman), Newark, N. J.

I claim the additional guide rods, H, in combination with the guides, D D, in the yoke, E, and with the base plate, F, screw, C, guide, C, guides, G G, and cross head, B, of a press, A, constructed and operating substantially as and for the purpose described.

64,585.—BENDING METAL.—Charles C. Schenbens (assignor to Samuel Lagowitz and Isadore Lehman), Newark, N. J.

I claim the punch, A, composed of the side pieces or jaws, a c, and center piece, b, in combination with the die, B, constructed and operating substantially as and for the purpose set forth.

64,586.—DRY HOUSE.—Judson Schultz, Ellenville, N. Y.

I claim the arrangement in the dry house of the vertical partitions, C, having slats, F, secured to their sides extending from the second floor, D, through the roof, E, their upper ends forming chimneys, M, having dampers, N, the lower ends provided with the heat regulating doors, L, and their front sides with doors, K, opening upon the floors, D G H, etc., extending across one side of the dry house their inner ends meeting the inner edges of the partition, C, substantially as herein set forth and for the purpose specified.

64,587.—PREPARING LEATHER FOR WEAR.—George V. Sheffield and James F. Coburn, Hopkinton, Mass.

We claim the improvement in preparing leather for wear, substantially as set forth.

64,588.—BLIND SLAT FASTENING.—F. R. Smith, Bennington, Vt.

I claim the cam, D, applied to the blind frame, to serve as a fastening for the slats, substantially as herein shown and described.

64,589.—WATER-PROOF LEATHER.—Robert Sponouse, Jersey Shore, Pa.

I claim the composition specified in the process of tanning the leather and its application and use in the manufactured article, substantially in the manner and for the purpose as herein described.

64,590.—THILL COUPLING.—Luman Squire, Norwalk, Ohio.

I claim the spring arms, c c', in combination with the bolt, E, provided with the shoulders, i, semi-elliptic in its transverse section, when constructed and arranged as set forth.

64,591.—PREPARING SMOKING TOBACCO.—A. F. Stayman, Baltimore, Md.

First, I claim the process herein described of preparing tobacco for smoking.

I claim as a new article of manufacture the smoking material herein described whether composed of tobacco proper, or partially of tobacco and partially of tobacco dust combined, when prepared substantially as set forth.

64,592.—DOUBLE SHOVEL PLOW.—H. Stephens, Mount Vernon, Ohio.

I claim the combination of the shovel stocks, B B, with the horizontal brace, C and the beam, A, when the same are constructed in the form and and manner for the purpose specified.

64,593.—STEAM GENERATOR.—G. Symmes and T. W. Hayes, Brooklyn, N. Y. Antedated April 26, 1867.

First, We claim the arrangement within the fire box or chamber, of one or more series of inverted cones forming steam generators and communicating with the body of the boiler, substantially as specified.

Second, The arrangement of generators in the fire box or chamber separately connected with the water space above or body of the boiler by pipes passing through the crown sheet of said chamber and with the lower portion of the water jacket, surrounding said fire box, by pipes running through the jacket and down or around the outside thereof, essentially as shown and described.

64,594.—COMPOUND FOR MAKING ARTIFICIAL STONE AND FOR COATING STONE AND BRICKS, ETC.—Joseph Tattersall, Indianapolis, Ind.

I claim the compound herein described together with such variations as may be produced by varying the proportions of the ingredients named, substantially as and for the purposes set forth and described.

54,595.—LOCOMOTIVE AND OTHER WHEELS.—George Tefft Salem, N. Y.

I claim the employment of the wedges, C C C C, in combination with the keys, D D D D, or their equivalents operating in the manner and for the purposes substantially as herein fully described and set forth.

64,596.—PAINT AND VARNISH BRUSH.—Ellis Thayer, Worcester, Mass.

First, I claim the combination with the brush handle, bristles and ferrule for holding the same upon the handle of an elastic packing interposed between the ferrule and bristles, substantially as and for the purposes set forth.

Second, In a brush as herein described the combination with the bristles and ferrule of an interposed tube of rubber or other elastic material, extending down upon the bristles below the ferrule as and for the purposes herein specified.

64,597.—WINDOW FRAME.—John H. Thomas, Philadelphia, Pa.

I claim a side piece for a window frame consisting of two sections or strips a a' grooved and connected together, substantially as set forth for the purpose specified.

64,598.—ALARM LOCKS FOR TILLS.—Cyrus Tucker, Bloomington, Ill.

First, I claim the series of tumblers, a, having one end heavier than the other and so pivoted as to cause them to tip, in combination with a supporting head, H, arranged to hold them in a horizontal position, substantially as shown and described.

Second, The combination of the pivoted tumblers, a, constructed as described with the supports, u, and levers, E, arranged for joint operation as herein described.

64,599.—HEATING STOVE.—J. S. Van Buren, South Troy, N. Y.

First, I claim the arrangement of the hot air chambers, E' A' and J, in combination with the fire box, B.

Second, I claim the flue, D, surrounding the fire box, substantially as shown and described.

Third, I claim the jacket, C, constructed substantially as described in combination with the furnace, A, and the flue, D.

64,600.—ROTARY STEAM ENGINE.—Joseph B. Van Duesen, New York City.

First, I claim the revolving cylinder, A, constructed so that its ends rotate within recesses in the side plates of the stationary chamber, F, substantially as shown and described for the purposes specified.

Second, The arrangement of the ingress and egress ports in relation to the permanent abutment and to the revolving cylinder fitted with a single sliding piston for operation, substantially as set forth.

64,601.—WINDOW FASTENING.—Philip Verbeck, Neenah, Wis.

I claim the button, C, pivoted to the sash and having the two eccentric arms, c c', and radial thumb piece, d, constructed and operating in such a manner that when the point of contact of the arm, c', with the jamb of the window frame is below the pivot, b, the sash is held raised, and when the point of contact of the arm, c, is above said pivot, the sash is held down as shown and described.

64,602.—COMPOSITION FOR INVIGORATING FRUIT AND FOREST TREES.—William Vermilya, Dayton, Ohio.

I claim the composition of matter formed by the mixture of the proportions of three pounds of sulphate of copper, one pound of sulphur, one ounce of saltpeter, and a half pound of iron filings, to be used as a tree invigorator and destroyer of vermin, which may be in and upon fruit and forest trees, as herein described.

64,603.—FLOUR BOLT.—J. W. Walters, Tiffin, Ohio.

First, I claim constructing the rod that actuates the hammer for a bolting reel, with a spring capacity in itself, for the purposes described and substantially as set forth.

Second, The combination of the stepped segment, E, and the spring rod, D, that actuates the hammer, with a flour-bolting reel, substantially as described.

Third, The pivoted segment, E, when constructed with steps, g, upon its point of contact with the spring rod, D, and made adjustable for the purpose described.

Fourth, The arrangement of the segment, E, with its stepped ribs in the top of the bolting reel case, substantially in the manner and for the purpose described.

64,604.—HORSE SHOE.—Christian Weitman, Hazelton, Iowa.

I claim the securing of the heel calks to a horse shoe, in the manner substantially as herein shown and described.

64,605.—PERMUTATION LOCK.—Seth Wheeler, Albany, N. Y.

First, I claim the permutation wheel in combination with a circular tumbler, an indicating dial, a sleeve, and a tooth or space for connecting the tumbler and dial, constructed and arranged substantially as and for the purposes specified.

Second, I claim a movable stud or tooth, in combination with the dial or tumbler as specified, whereby the tumbler can be placed in a greater number of positions relatively to the dial than there are teeth in the gear, as set forth.

Third, In combination with a series of tumblers, as set forth, I claim a key formed of a series of changeable or adjustable rings acting on studs or projections, as specified.

64,606.—SORGHUM EVAPORATOR.—N. H. Whisemand, Independence, Iowa.

I claim the arrangement of the sectional compartments, a, openings, C', compartments, C, and gates, E F, in combination with the section, B, and strainer, G, operating conjointly as and for the purposes set forth.

64,607.—PAINT BRUSH.—John S. White Boston, Mass.

I claim the improved paint brush, metallic cap tube, B, made in sections parts, united and readily separable, as and for the purpose as hereinbefore described.

64,608.—SLIDE FOR FASTENING ENVELOPES, POCKET BOOKS, ETC.—John W. Wilson, New York City.

I claim constructing a metal slide, a, with spurs or projections, d d, at the ends of the slots, c c, for securing envelopes, portemonnaie, or other similar articles, formed and attached in the manner substantially as herein described.

64,609.—PLANING MACHINE.—A. A. Wilder, Detroit, Mich. Antedated March 5, 1867.

First, I claim the combining and arranging of cutters in a planing machine, in the manner substantially as shown and described, whereby lumber is prepared for flooring or ceiling by tonguing, grooving, and planing the same at one operation, and making two or more finished pieces of lumber out of one without the use of a saw.

Second, The self-adjusting feed level wheels, E and E', when constructed

and operating in the manner substantially as shown and described and for the purpose set forth.

Third, The combination of the shield, r, spring, s, and roller, q, constructed and operated in the manner substantially as shown and described and for the purpose set forth.

64610.—RACK FOR WHIPS.—E. P. Willets, North Hempstead, N. Y., assignor to Edward Richmond.

First, I claim a rack for holding and suspending whips and other articles, consisting of one or more plates of wood or other suitable metal, in which a series of orifices or perforations is formed, combined with a corresponding perforated sheet of rubber or other elastic substance, and for the purposes herein set forth.

Second, In a rack for suspending whips and other articles, as described, I claim the combination with the perforated plates of wood or other suitable material, of a perforated sheet of vulcanized rubber or other elastic substance, interposed between the said plates under the arrangement herein specified, so that the whip or other article, when inserted in the orifice formed in the plate, shall be held by the elastic substance, substantially as set forth.

64,611.—MEDICAL COMPOUND.—James A. Willis, Cherry Valley, N. Y.

I claim the medical compounds, substantially as and for the purposes described.

64,612.—MOP HEAD.—John A. Wilson, Spencer, Mass.

I claim securing the mop head, H, to the endless apron, F, which passes around the upper roller, E, and lower roller G, in the mop head, A, as herein set forth for the purpose specified.

64,613.—METAL SOCKET FERRULE.—Thomas H. Windle, Westchester, Pa.

I claim in a cast metal socket ferrule for removable forks, drags, etc., the two lips, a2 a2, with the upper and the lower separate longitudinal bearings, as a3, each of the latter being of the same width as the shank of the fork or drag, as set forth, for the purpose of supporting the fork, and allowing its shank to be loosened with greater facility and safety in case of its becoming rusted fast, as described.

64,614.—BEER AND MASH COOLER.—C. Wise and B. Loeffler, New York City.

We claim a cooler for mash beer and other liquids, consisting of a circular stationary pan, B, in combination with a revolving shaft, D, to which the fan or fans, K, and stirrers, H, are adjustably secured, substantially as and for the purpose herein shown and described.

64,615.—HARVESTER.—David Wolf, Lebanon, Pa.

I claim the flanged extension part, L, in combination with the hinged jointed platform, H, substantially as and for the purposes described.

64,616.—WOOD-BURNING STOVE.—Gurdon G. Wolf, Troy, N. Y.

First, I claim the employment of the chamber, H, divided by means of the partition, K, containing the movable damper, C, in combination with the rear or back column flues, B, by means of which the direct and circuitous draft is had, in the manner substantially as herein described and set forth.

Second, I claim the broad bottom flue, D, in combination with the front column flues, A, and with the rear or back column flues, B, each being arranged in the manner substantially as herein described and set forth.

64,617.—HEATING AND PUDDLING FURNACE.—M. S. Ridgway, Danville, Pa., and Christopher Lewis, Harrisburg, Pa.

First, We claim the double-furnace plates for containing a body of water to preserve them and moderate the external heat, preventing the wear of bricks and the breaking of the plates by expansion or contraction, substantially as and for the purpose described.

Second, The stack constructed, in whole or in part, of water plates, substantially and for the purpose described.

Third, The door at the base of the stack, for the purpose of allowing the heater or puddler to take out the cinder and other refuse, instead of destroying the brick as is now the case, substantially as described.

Fourth, The water plates in the stock-hole frame, working door, frames, and fire plate, either or all, substantially as and for the purpose set forth.

REISSUES.

2,589.—MANUFACTURE OF INDIA RUBBER ROLLERS.—James B. Forsyth, Roxbury, Mass. Patented Nov. 13, 1866.

I claim a roller for clothes wringers and for other purposes made substantially as herein described as a new article of manufacture.

2,590.—ANIMAL TRAP.—C. Jillson, Worcester, Mass. Patented Nov. 16, 1858.

First, I claim a rat or animal trap in which the jaws are moved in a plane and parallel with each other, and which when tripped shall close up or contract the said opening, substantially as herein described and represented and for the purposes set forth.

Second, Casting or forming the piece to which the rear end of the toggle joint is hinged in an animal trap in which a toggle joint is used to set the trap by bringing the joints upon a line or nearly so with a lip or projection, m, for the purposes stated.

Third, The combination of the adjusting screw, n, with the lip or projection, m, in an animal trap, for the purposes stated.

Fourth, The combination in an animal trap of a hinged trigger, E, and hinged arm, F, with an adjusting screw to regulate the set of the trap, for the purposes stated.

2,591.—TILES AND BRICK FOR ROOFING AND OTHER PURPOSES.—Robert O. Lowrey, Tabor, Iowa. Patented Feb. 5, 1867.

First, I claim a plastic cement composed of marl or clay and sand and coal tar mixed together in suitable proportions, substantially as described.

Second, A roof composed of unglazed and unburned slabs or tiles which are secured firmly down upon the roofing boards and then covered with a cement consisting of marl or clay and sand and coal tar, substantially as described.

2,592.—PAINT CAN.—Herman Miller, Hoboken, N. J. Patented March 26, 1867.

I claim the cover, B, which is made of wood, iron, or other suitable material, and which is screwed to the paint can, A, for the purpose of easily opening and reclosing the same, substantially as herein shown and described.

2,593.—APPARATUS FOR SUPPLYING GAS ON STEAMBOATS AND OTHER VESSELS.—N. Treadwell, New York City. Patented Sept. 25, 1866.

I claim a pumping mechanism applied between the gas holder and the burners on a boat or vessel, for taking the gas from the holder and supplying the same to the burners, substantially as set forth.

2,594.—CUTTING DEVICE FOR HARVESTERS.—C. Wheeler, Jr., Poplar Ridge, N. Y. Patented Sept. 2, 1856.

I claim in combination with the guard finger ledger plate and scolloped cutter, as described, the plate resting on the finger bar as a bearing for the rear projections of the cutter, and to give an open space between the cutter and finger bar for the passage of dirt and grit, substantially as described.

I also claim in combination with the ledger plate a guard finger having a rigid cap and an open space behind the cutters, a recess in the body of the guard extending from the point of connection of the cap with the body of the finger back to the finger, substantially as described.

I also claim the ledger plate locked with the guard finger by projections on the under side of the plate so as to prevent lateral movement, in combination with the ledge, to prevent vertical movement at its front end, substantially as described.

I also claim the combination of the ledger plate with the guard finger so as to make a finger having a slot through which the cutter vibrates that is wider vertically at its back than at its front end, and that has an enlarged opening in rear of the cutter bar for the discharge of grit, fiber, etc., substantially as described.

I also claim arching the cap of the guard finger and extending it back and uniting it to the body of the guard finger in the rear of the finger bar, so as to form an open space between it and the finger bar, for the knife bar and the rear part of the cutters to operate in, substantially as described.

2,595.—PENCIL POINT PROTECTOR.—George Merritt, New York City. Patented March 5, 1867.

First, I claim a pencil point protector made with two or more wings A1 A2, adapted to fit on the enclosed pencil M, substantially as herein specified.

Second, I claim the metal piece A A1 A2, and the spring B, adapted to operate together upon the end of an ordinary wood pencil substantially as and for the purpose herein specified.

Third, I claim the combination of a rubber eraser D, with the metallic portion so as to give the proper erasive property to the exterior and also to contribute by its contractile force to the clasping of the metallic portion upon the wood of the contained pencil substantially as herein specified.

Fourth, I claim the scolloped and flaring mouth at a2, on the metallic pencil point protector, substantially as herein specified.

2,596.—TANNING.—John M. Muller, Kobleskill, N. Y. Patented Nov. 14, 1865.

First, I claim a tanning ooze which is made from the ingredients herein mentioned and combined in about the proportions set forth.

Second, The combination and use of yarrow and other astringent substances for making an ooze for tanning.

Third, Subjecting stuffed or unstuffed skins or leather to the action of a steam bath substantially as described.

2,597.—MANUFACTURE OF PHOSPHORIC ACID AND PHOSPHATES FOR USE IN THE PREPARATION OF FOOD AND FOR OTHER PURPOSES.—The Rumford Chemical Works, Providence, R. I., assignees by mesne assignments of E. N. Horsford.—Patented April 22, 1856.

First, I claim the mixing in the preparation of farinaceous ood, with flour of a powder or powders such as described consisting of ingredients of which phosphoric acid or acid phosphates and alkaline carbonates are the active agents for the purpose of liberating carbonic acid as described, when subjected to moisture or heat or both.

Second, The use of phosphoric acid or acid phosphates when employed with alkaline carbonates as a substitute for ferment or leaven in the preparation of farinaceous food.

DESIGNS.

2,644.—STATUETTE.—Thomas H. Dorian, Washington, D. C.

2,645.—TRADE MARK.—Martin V. B. Ferris, South Norwalk, Ct., assignor to himself and Charles E. Ferris, Attica, N. Y.

2,646.—SPOON, KNIFE, OR FORK HANDLE.—Philo B. Gilbert, New York City.

2,647 to 2,649.—COFFIN HANDLE.—C. L. Nieberg (assignor to Sargent & Co.,) New Haven, Ct. Three Cases.

2,650.—WOOD STOVE.—Lewis Rathbone, Albany, N. Y.

2,651.—COAL STOVE.—Lewis Rathbone, Albany, N. Y.

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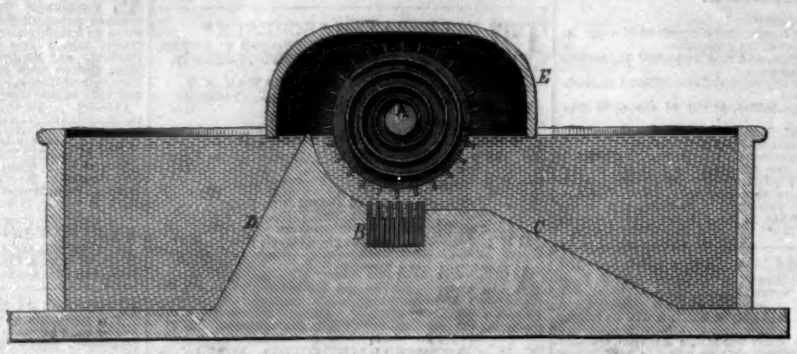
Shew's Rag Engine.

We have seen in a paper mill the rag machine effectually clogged by the accumulation of the fibrous material around the shaft, which added to the friction to such an extent as nearly to stop the machine and cause the belts to slip and drag. The simple device shown in the engraving is intended to obviate this difficulty, and appears to be well adapted to the purpose.

The engraving is a section of an ordinary engine tank, A being the cutting cylinder and B, the box plates or stationary cutters. C is the rising incline and D the falling incline. E is the cover of the cylinder. The direction of motion of the cylinder is from C toward D. On each end of the cylinder is a volute or spiral flange the pole of which is at the shaft, A. In the rotation of the cylinder, if any portion of the rags should work in between the cylinder ends and case, E, the action of the volute would be to force it to the surface and thus keep the shaft clear at all times. It is evident this device will accomplish the object for which it is intended, and it is certain the cost of it would be very slight. It could be attached to mills already in operation as well as form a part of new built machines.



SHEW'S IMPROVEMENT ON RAG ENGINES.

A patent was obtained for this improvement through the Scientific American Patent Agency, Dec. 18 1866, by James M. Shew. Any further information desired, may be had by addressing Shew & Bellinger, Glen Rock, Pa.

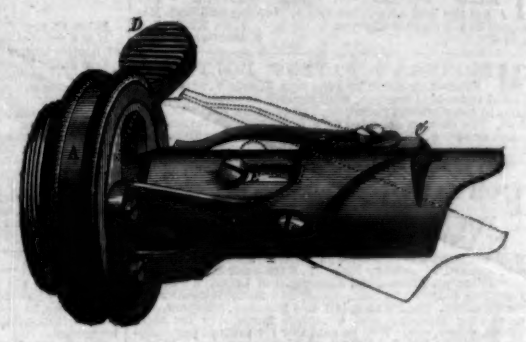
HOW RUSSIA LEATHER IS MADE.

The inimitable products of ripened manufactures in ancient seats can only be attained by other communities by first closely studying the principles and modes of operation, and then patiently practising the art until the manual "mystery," which is in all refined manufactures the greatest part, is mastered by the skill of generations of workmen. This is a difficult and not sudden success; but it is at once of the most honorable and durable kind. Some nations have more genius and disposition than others for patient excelling. Perhaps if the accomplishments of each nation could be closely examined with reference to the qualities as well as the circumstances that favor them, a clear family likeness might be traced between the parental character and its material offspring. What the Russians possess by nature specially adapting them to the production of Russia leather and sheet iron, we shall not pause to inquire; although the tanners of all Europe have come their best in vain to emulate the former product; but the communicable part of the process they pursue, is stated as follows by one who has been there to investigate it.

The best material for the red leather is goat skin, on account of its softness and smoothness; but the largest beef hides and ram's skins are also worked. The skins are first put into running water for one week, during which time they are taken out daily and thoroughly beaten with a wooden brake, a work of skill and patience, which breaks up the "nerve" and softens the fiber to a pulpy condition. Next, they spend a month in a lye made of lime or ashes, of which the exact quality, as we have no chemical description, must be left to judgment and experiment. The hair is then removed, and the alkaline properties are got rid of by soaking the skins in an infusion of white gentian in fresh water for twenty-four hours. The swelling of the skins is now a matter of particular care, for which they are soaked four or five days in a mixture of oat meal and water. They are now ready for the tannin, which is extracted from the bark of the willow. (What special virtue there may be in the Russian vegetable products employed may possibly be worth an easy inquiry.) In the first solution, the skins remain but three days, and are again beaten with the brake. The second solution, which is stronger than the first, retains them eight or ten days. They are then dried with the flesh side upward; again beaten, then greased, dyed, and finished; using logwood and alum for red, and alum and green vitriol for the dark color. The mode of dyeing is peculiar. A number of skins are sewed up into the form of a sack, closed all around except a small opening at one end to admit the dyeing liquid. They are kept in motion in the dye until it has reached all parts, and then hung up to drain. The exclusion of light and air, and the slow draining in close contact may have some importance in practice. The skins are then dried, and again dyed with a sponge. The whole process is repeated two or three times. They are next greased again on the flesh, and grained with a notched stick passing through the length and breadth of the skin until small furrows are gradually produced. After graining they are greased again, with birch or linseed oil, and put on the wooden horse to be smoothed. The birch oil contributes evidently to the undefinable characteristic odor by which Russia leather is distinguished.

DICKEY'S IMPROVED CHARGER.

The ignition of the powder and bursting of the flask with consequent injury to the sportsman, is a not unfrequent accident accompanying the use of muzzle-loading fowling pieces. A fragment of the wadding remaining in the gun may ignite the powder poured from the charger, and the flame of the explosion rush into the flask exploding the powder therein contained. If this does not occur the hand is burned, as it is held, in the act of charging, directly over the muzzle. But with the charger shown in the engraving neither the hand nor the flask is held in range of the barrel, and if the powder from the charger should prematurely explode, it will not ignite that in the flask, as the communication between the two is closed.



The charger is a tube affixed to the top of a powder flask, A, by being pivoted to a saddle support at B, which allows it to be turned to the position shown in the dotted lines. The top of the tube is closed by a cut-off, C, which is a portion of the support, B.

In using this charger it is filled in the usual manner by opening the spring slide, D, and then the end of the tube is inserted in the barrel muzzle at an angle, and the hand holding the flask depressed. This opens the cut-off, C, by the leverage of the projecting point of the tube against the inside of the muzzle which presses back the tube into the position of the dotted lines. The spring on the support, B, bears upon the inner end of the tube and returns it to place when the pressure of the hand is removed. A slide, seen at E, regulates the size of the charge.

Evidently this improvement lessens the possibility of danger in charging fowling pieces or rifles, and the device seems to be simple and durable. It was patented through the Scientific American Patent Agency, Jan. 23, 1866, by Clement C. Dickey, whom address for rights, etc., at 2,031, Chestnut street, Philadelphia, Pa.

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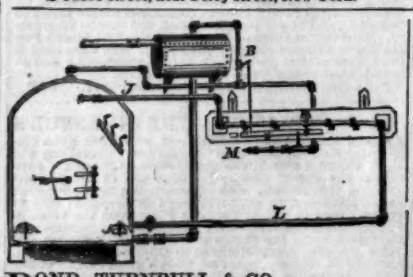

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